PHOTO ALBUM

L-39ZA of the Czech Air Force seen during the Czech International Air Fest 2003 at Brno
All photos © George Papadimitriou

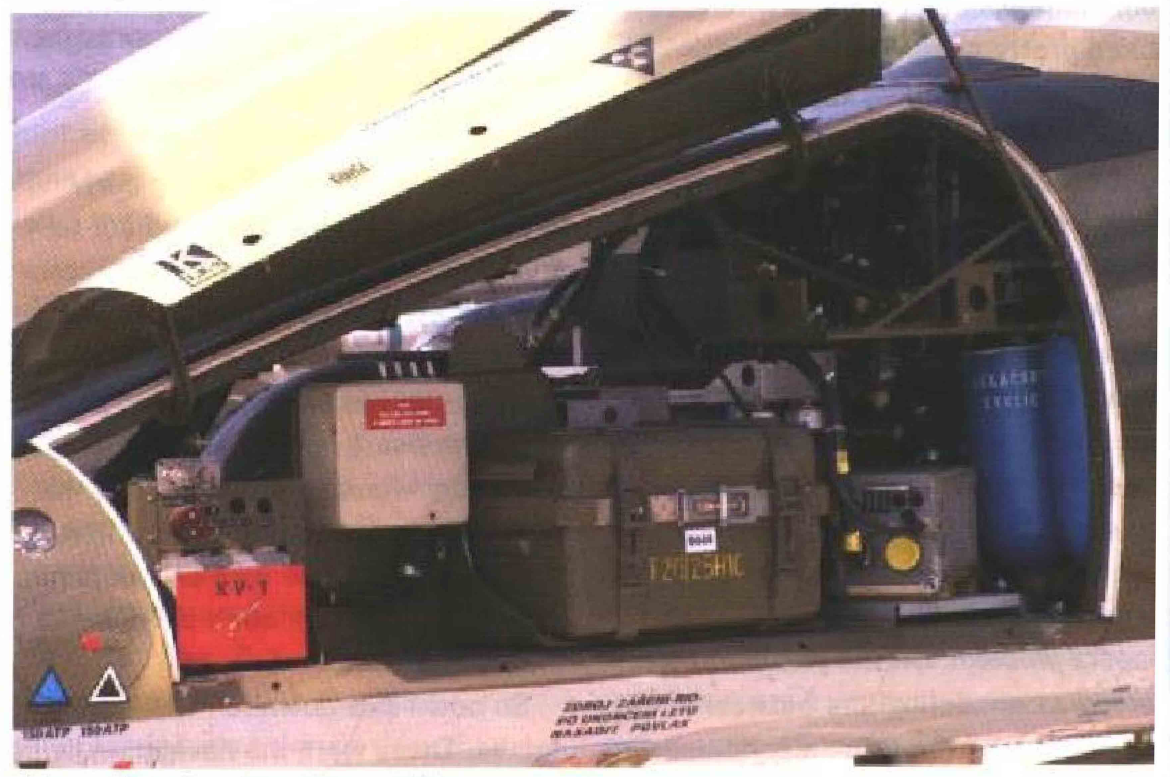
An overall view of this machine on the hardstanding

The port side of the forward fuselage

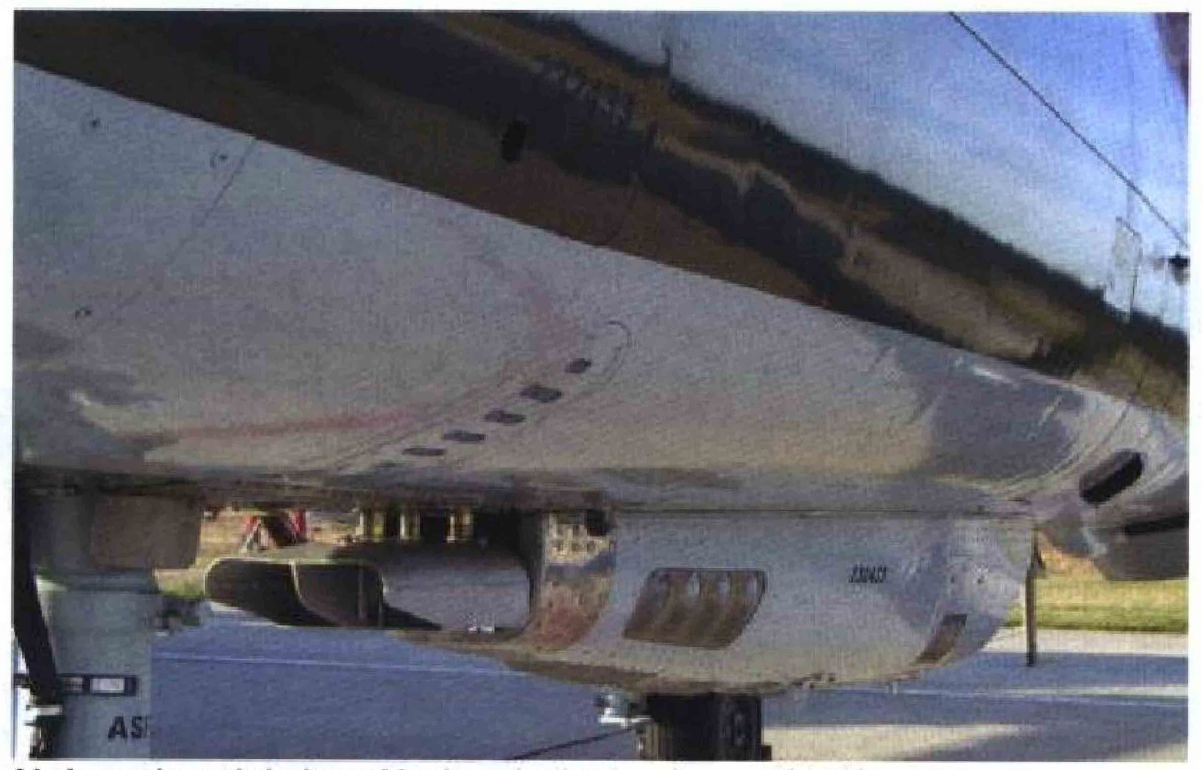
Close-up of the hinged access panel on the port fuselage side

One of the ammunition boxes for the ventral gun seen partially removed

Overall view of the rear fuselage and vertical fin



The nose bay viewed from the port side



A look up underneath the forward fuselage, showing the twin gun pack in this area

The ventral gun pack, seen from the starboard side

The rest of the airframe, of interest (for diorama builders) is the access platform

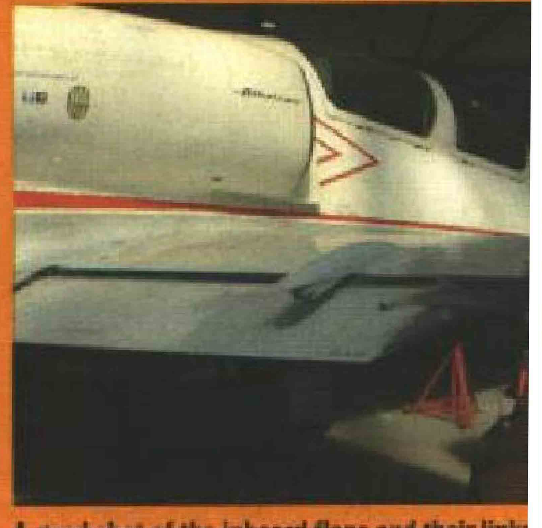
The crew access steps in the port side of the forward fuselage

The L-39 prototype X-05 preserved in the aviation museum at Prague-Kbely. All photos © George Papadimitriou

A look up into the jet exhaust on this prototype

A useful shot showing both the outer and inner faces of the main wheels

An overall view of the X-05 prototype



A good shot of the inboard flaps and their link

The ejection seat removed from the airframe, where you can see a lot of detail usual obscured when it is installed

FINAL VERDICT

There are two parts to my conclusive ranting, the first the kit, the second the resin sets.
The kit: on its own MPM's limited-run kit is pretty good. Nice moulded detail on well fitting parts, that builds up into an exceptionally accurate shape. Length and span are absolutely spot on and the only discrepancy I could find is with the height, the kit being about 2mm too low. Undercarriage positioning I guess, as the fin and fuselage look right. But this is a seriously minor niggle.

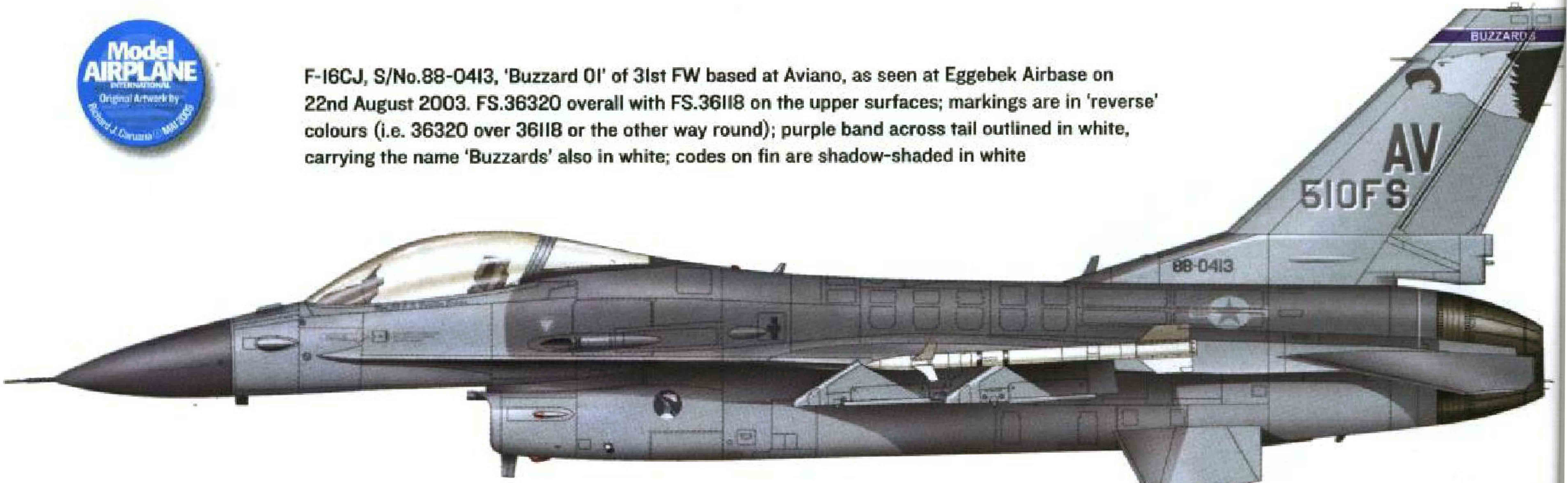
The Resin: these additional sets bring one thing to the party - detail. The cockpit set is lovely, those instrument panels and ejector seats are worth the price alone. The exterior set, with all the control surfaces may require major surgery to be carried out but the character they provide is again worth the money. My only reservation comes with the intake set. I think that the little black box in the rear fuselage looks a little out of place, being the only opened panel. The jet pipe is nice but then the kit one isn't half bad either, and the intakes are not a really noticeable improvement, whilst the compressor fan blades can't even be seen on the finished kit unless you get a torch and actually climb in there.

Personally I would say you can give that one a miss but all in all the effects on MPM's L-39 are worth the effort and cash. If this is the kind of quality and finished result we can expect from both MPM and Czech Master Kits, I'll definitely be looking out for more of their products.
Oh, and by the way, in case you were wondering, of the 110 parts in the kit, 69 of them remained unused in total; that's quite a haul for the spares box!

Was it worth the effort?

Oh yes! Anything this pretty has to be worth fighting for.

F-16CJ, S/No.88-0413, 'Buzzard 01' of 31st FW based at Aviano, as seen at Eggebek Airbase on 22nd August 2003. FS.36320 overall with FS.36118 on the upper surfaces; markings are in 'reverse' colours (i.e. 36320 over 36118 or the other way round); purple band across tail outlined in white, carrying the name 'Buzzards' also in white; codes on fin are shadow-shaded in white



F-16CG, S/No.88-0491, 510st FS, 31st FW, Aviano, Italy. Standard scheme with purple band across tail carrying name 'Buzzards' in white; unit badge on port side of air intake only

F-16CG, S/No.89-031, 125th FS 'Tulsa Vipers', 138th FW, USAF (ANG), Tulsa. Standard scheme with red band across tail with 'Tulsa' in white; Indian head on both sides of fin

F-16CJ, S/No.91-0352, 52nd FW, Spangdahlem, Germany. Standard scheme with lettering shaded in black; red/yellow/blue flash across tail

F-16CJ, S/No.92-3918, 23rd FS, 52nd FW, Spangdahlen, Germany. Standard scheme with blue band across tail with name 'Fighting Hawks' in white

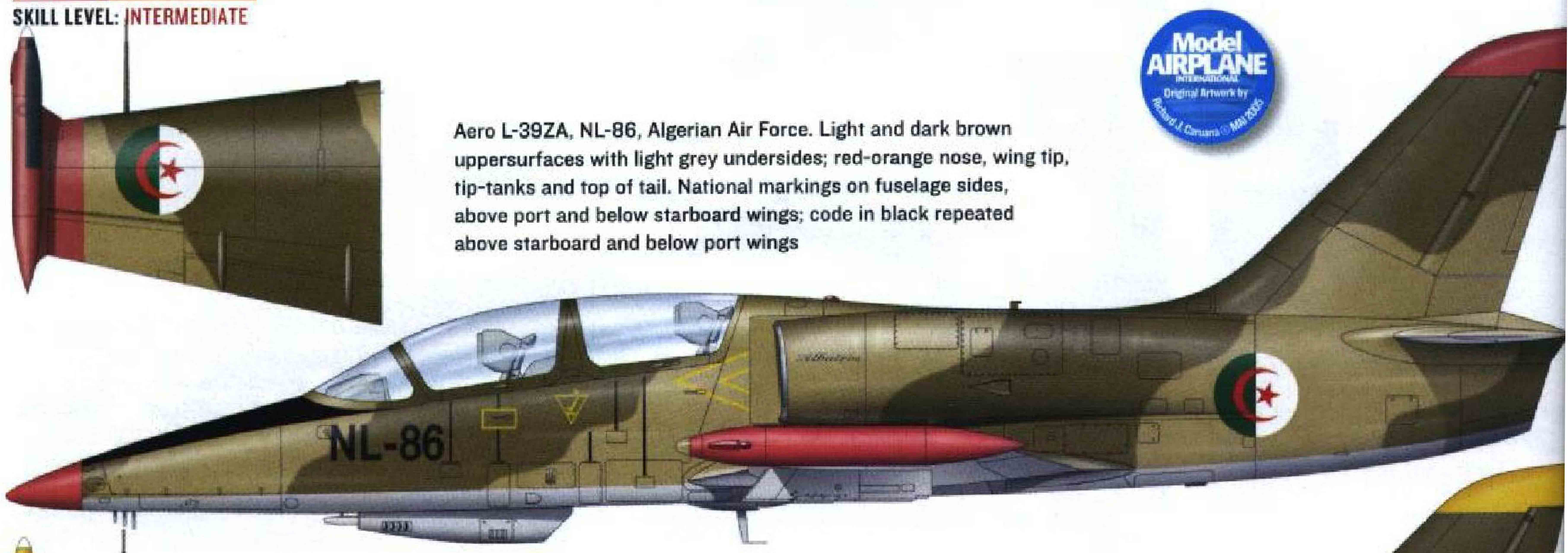
F-16C (Block 50), S/No.93-1058, 341 Mira, Greek Air Force. 'Ghost' scheme in FS.36307, 35237 and 36251; red stripe across top of tail. Roundels above port and below starboard wings only

F-16C (Block 52), 612, No. 140 Squadron, Singapore Air Force, during its participation at 'Western Arc' exercises, Dijon AB, September 2004. FS.36375, 36320, 36118 with red/black checks across tail. Note style of pilot's name under cockpit

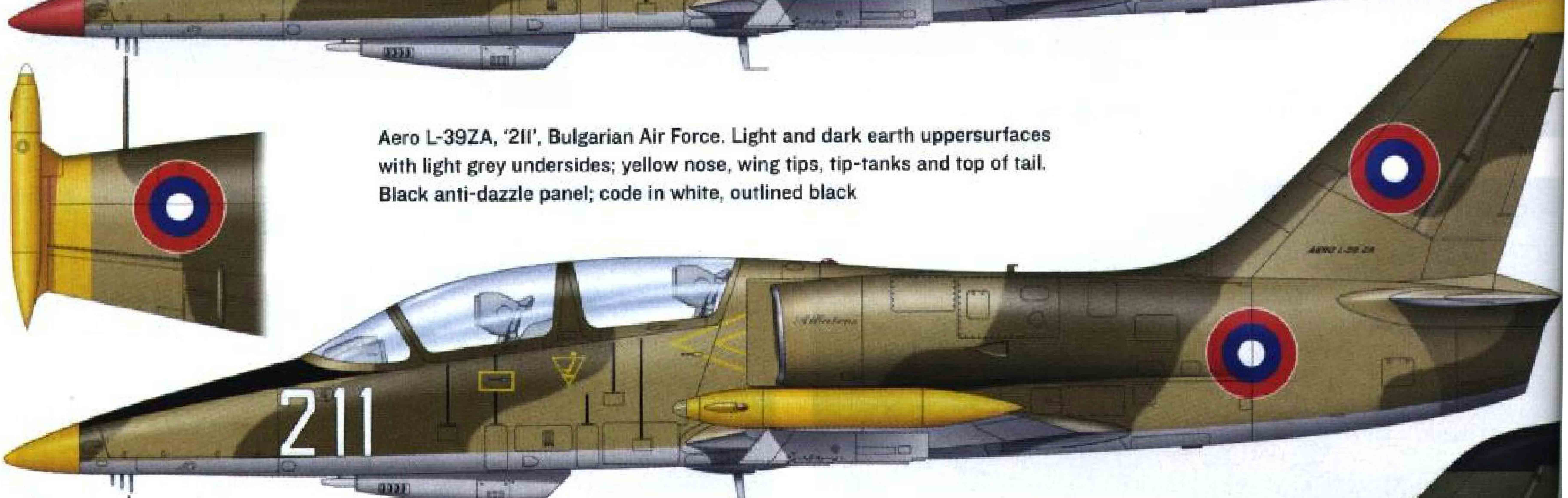
DCC Lim Swee Koon

F-16C (Block 40), S/No.90-0006, 162 Filo 'Zipkin', Bandirma AB, Turkish Air Force. FS.36375, 36320, 36118 with yellow/black checks across top of tail; roundels on fuselage sides, above port and below starboard wings

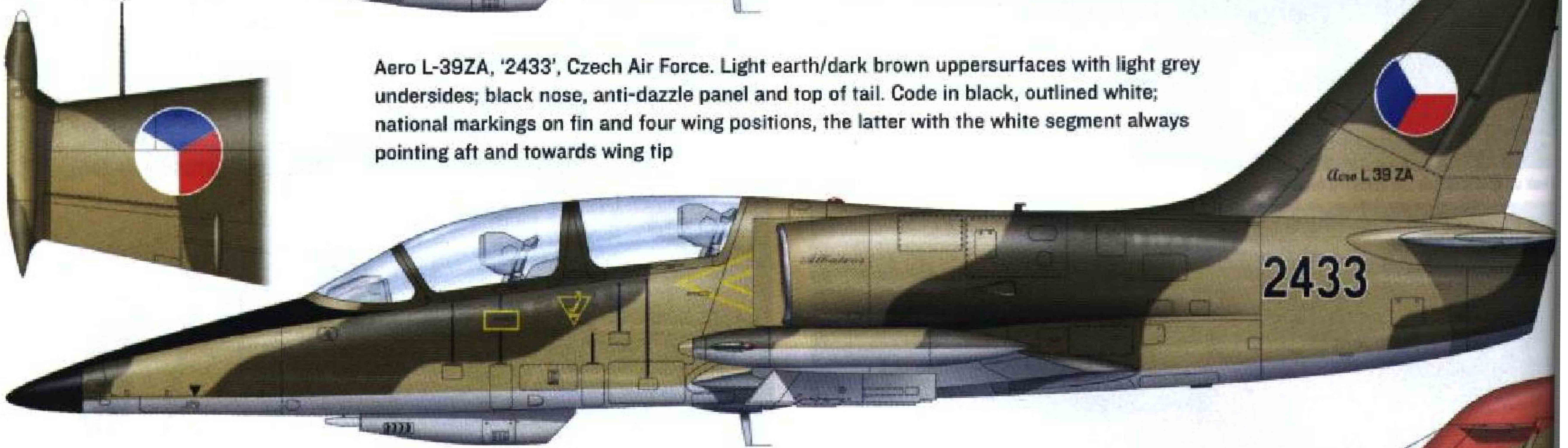
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2005



Aero L-39ZA, NL-86, Algerian Air Force. Light and dark brown uppersurfaces with light grey undersides; red-orange nose, wing tip, tip-tanks and top of tail. National markings on fuselage sides, above port and below starboard wings; code in black repeated above starboard and below port wings

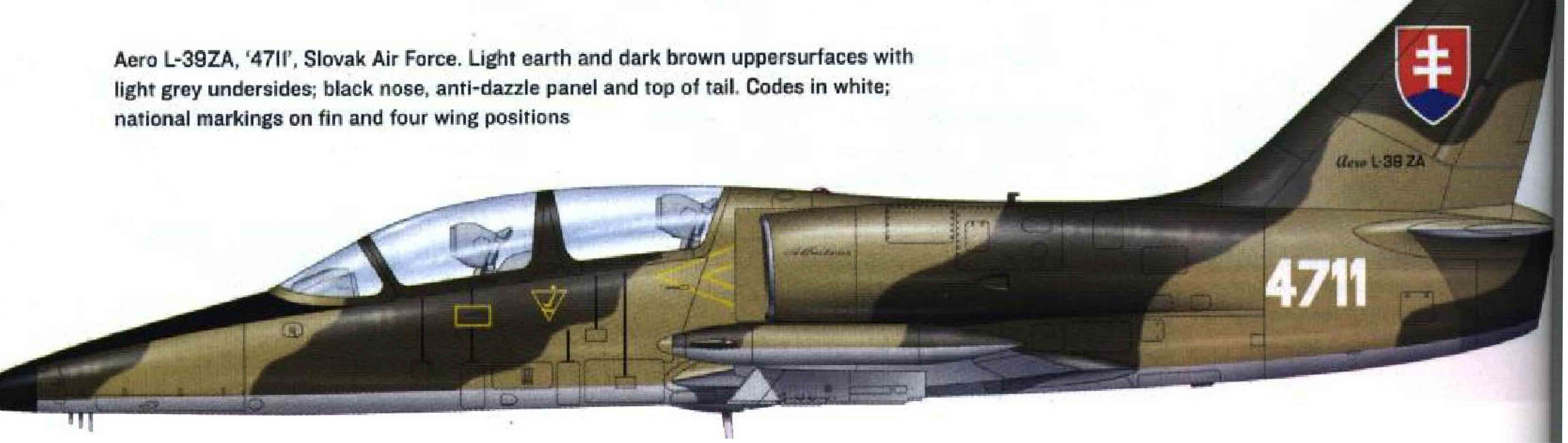


Aero L-39ZA, '211', Bulgarian Air Force. Light and dark earth uppersurfaces with light grey undersides; yellow nose, wing tips, tip-tanks and top of tail. Black anti-dazzle panel; code in white, outlined black



Aero L-39ZA, '2433', Czech Air Force. Light earth/dark brown uppersurfaces with light grey undersides; black nose, anti-dazzle panel and top of tail. Code in black, outlined white; national markings on fin and four wing positions, the latter with the white segment always pointing aft and towards wing tip

Aero L-39ZA, '06', Lithuanian Air Force. Light sand/dark olive green uppersurfaces with light grey undersides; red-orange nose, wing tips, tip-tanks and top of tail. Black anti-dazzle panel; '06' light blue, outlined in white. Black/white cross marking on fin and four wing positions



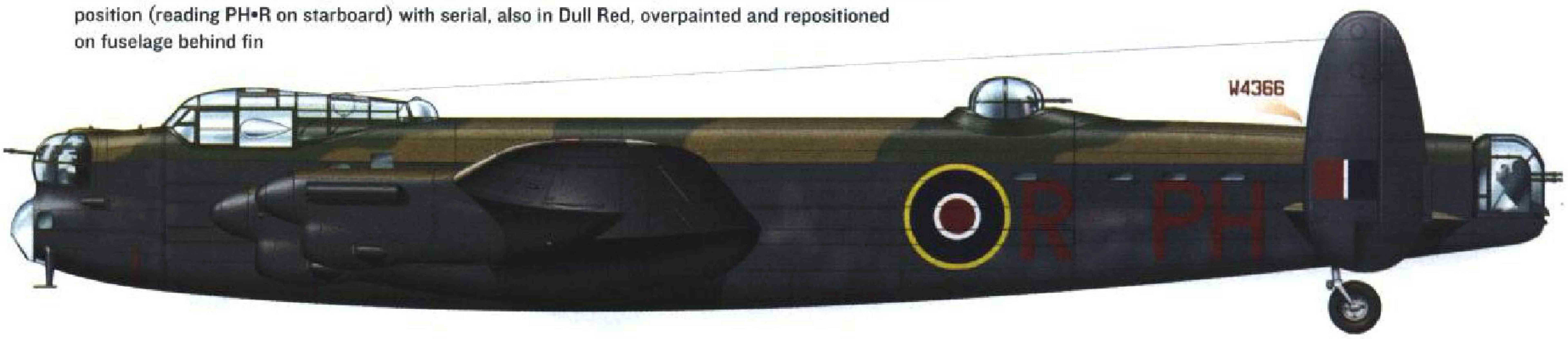
Aero L-39ZA, '4711', Slovak Air Force. Light earth and dark brown uppersurfaces with light grey undersides; black nose, anti-dazzle panel and top of tail. Codes in white; national markings on fin and four wing positions

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2005

Avro Lancaster L7537, KM•L, No.44 (Rhodesia) Squadron, Waddington, January 1942. Dark Earth/Dark Green uppersurfaces with Night undersides; Light Grey codes and Dull red serial. Note unfaired dorsal turret. First Lancaster delivered to a Bomber Command squadron

Avro Lancaster B Mk I, L7571, OF•X of No.97 Squadron RAF, Woodhall Spa, April 1941. Dark Earth/Dark Green on upper surfaces, Night undersides. AI roundels on fuselage and B type above wings (no markings under wings). Note early style fin flash, Light Grey codes, and three mission markings in white on the nose

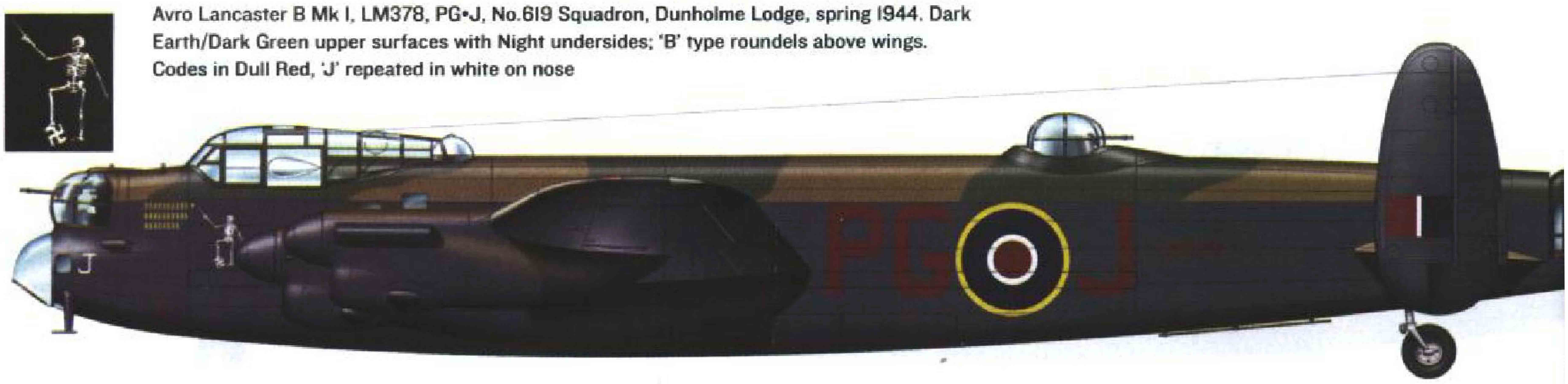
Avro Lancaster B Mk I, W4366, PH•R, No.12 Squadron, Wickenby, March 1943. Dark Earth/Dark Green upper surfaces with Night undersides; 'B' roundels above wings. Dull red codes in nonstandard position (reading PH•R on starboard) with serial, also in Dull Red, overpainted and repositioned on fuselage behind fin



Avro Lancaster B Mk III, ND968/G, AR•O of No.480 Squadron, Royal Australian Air Force, Binbrook, 1945. Dark Earth/Dark Green upper surfaces with Night undersides. CI roundels on fuselage sides, B roundels above wings (no markings under wings). Note 67 mission markings, consisting of red bombs with yellow wings, and name 'BERYL' in white on the nose

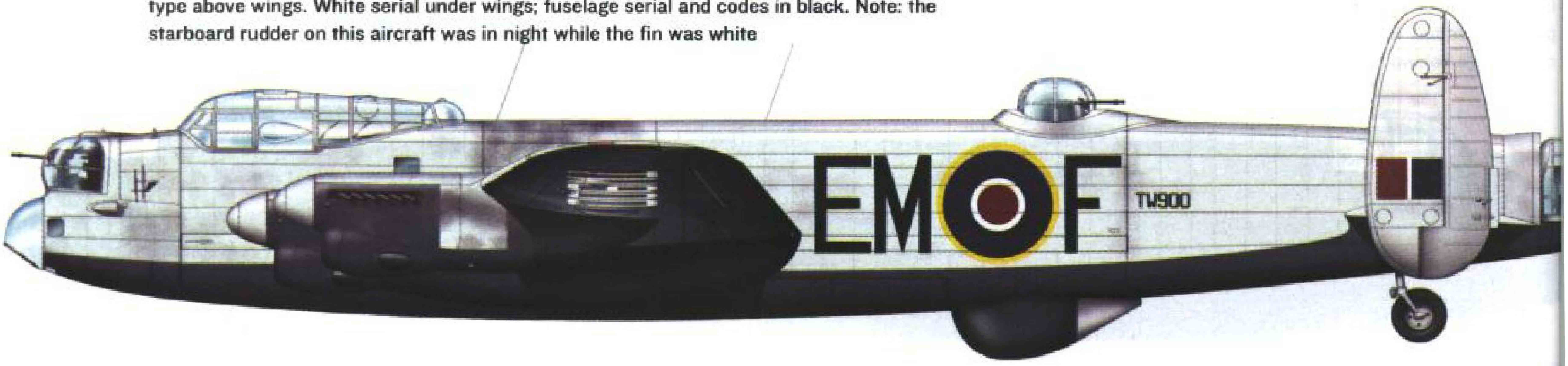
Avro Lancaster B Mk I, PA308, AS•W of No.166 Squadron RAF, Kirmington, August 1945. Dark Earth/Dark Green upper surfaces with Night undersides. Codes and serial Dull Red, CI roundels on fuselage, B type roundels above wings. 'W' repeated in yellow on nose, propeller spinners in red and serial repeated in white under wings, reading from leading edge under port and from trailing edge under starboard. Note bulged bomb bay

Avro Lancaster B Mk I, LM378, PG•J, No.619 Squadron, Dunholme Lodge, spring 1944. Dark Earth/Dark Green upper surfaces with Night undersides; 'B' type roundels above wings. Codes in Dull Red, 'J' repeated in white on nose

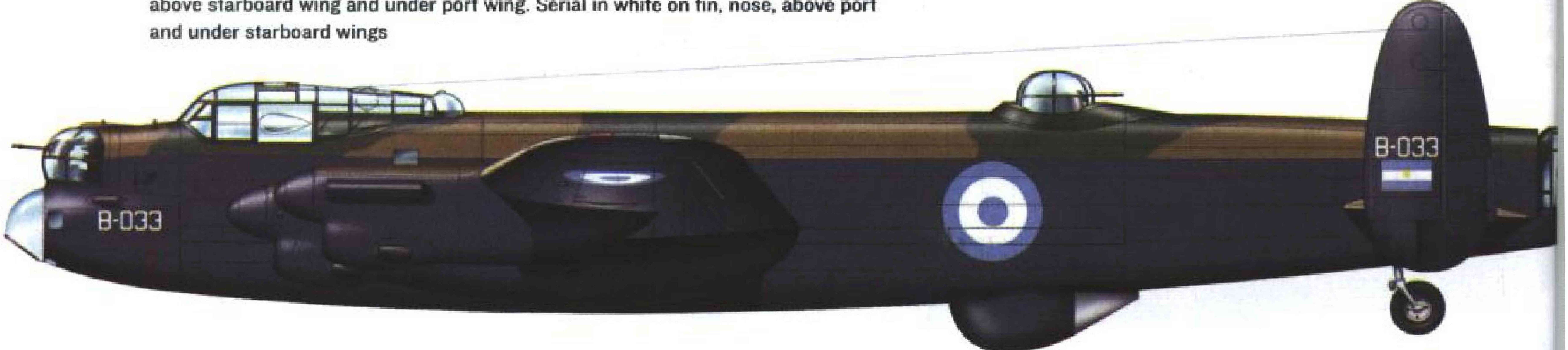


Avro Lancaster B Mk I, NG358, LS•H, No.15 Squadron, Mildenhall, June 1945. Dark Earth/Dark Green upper surfaces with Night undersides; 'B' type roundels above wings. Yellow horizontal bars across fins (inside and outside faces); note mustard gas detection patch ahead of dorsal turret

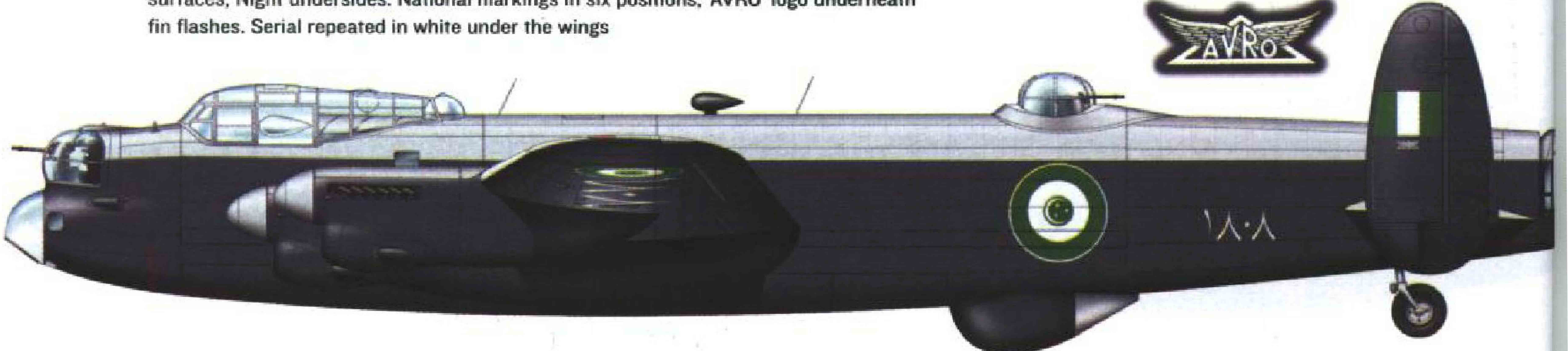
Avro Lancaster B Mk I (F.E.), TW900, EM•F, No.207 Squadron, early 1948. Heavily weathered white upper surfaces with Night undersides; 'CI' type roundels on fuselage sides and 'C' type above wings. White serial under wings; fuselage serial and codes in black. Note: the starboard rudder on this aircraft was in night while the fin was white



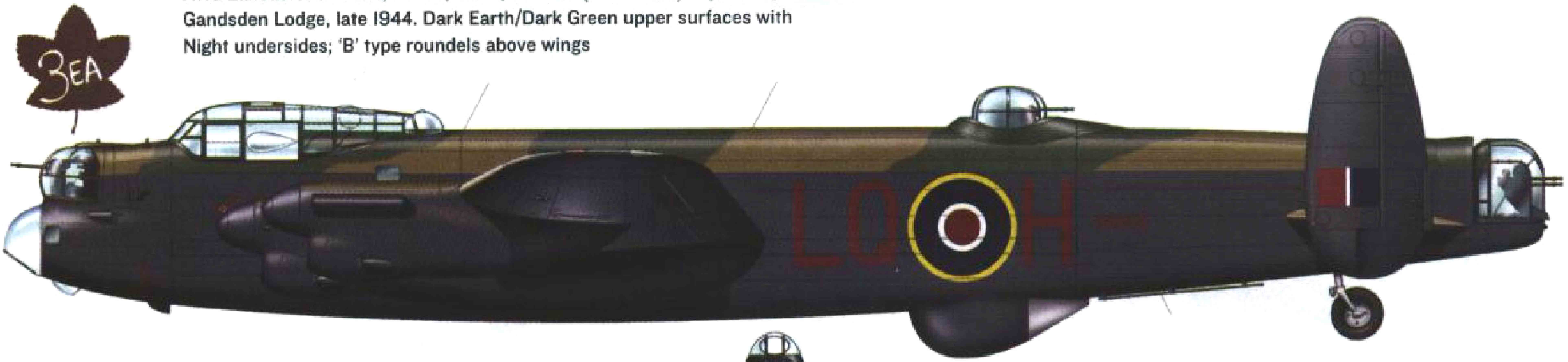
Avro Lancaster B Mk I, B-033 (ex-PA348), Argentine Air Force, 1947. Dark Earth/Dark Green upper surfaces with Night undersides; national markings on fuselage sides, above starboard wing and under port wing. Serial in white on fin, nose, above port and under starboard wings



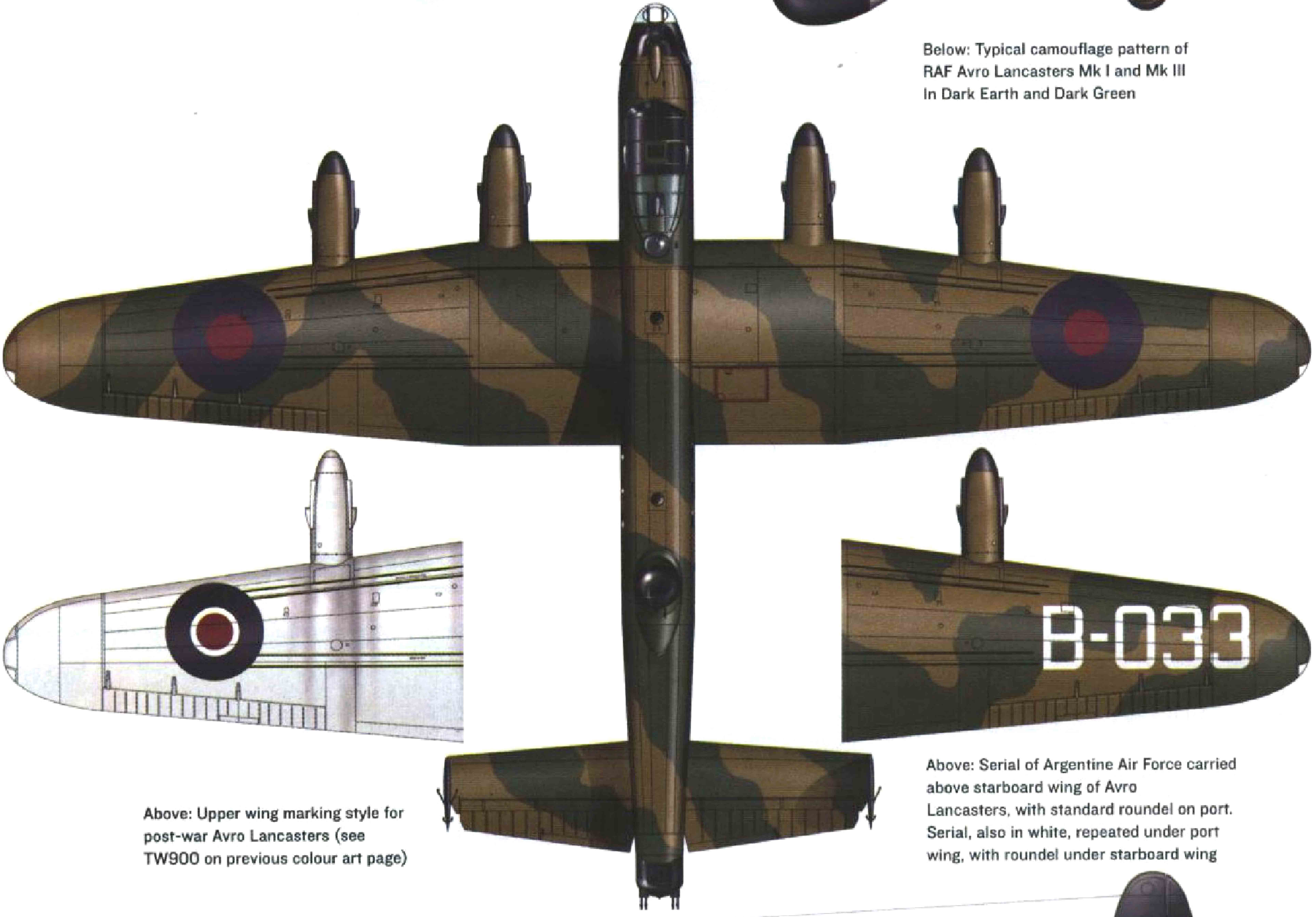
Avro Lancaster B.I, 1808, Royal Egyptian Air Force, 1952. Medium Sea Grey upper surfaces, Night undersides. National markings in six positions; 'AVRO' logo underneath fin flashes. Serial repeated in white under the wings



Avro Lancaster B Mk III, PB513, LQ•H, No.405 (Vancouver) Squadron, Gandsden Lodge, late 1944. Dark Earth/Dark Green upper surfaces with Night undersides; 'B' type roundels above wings



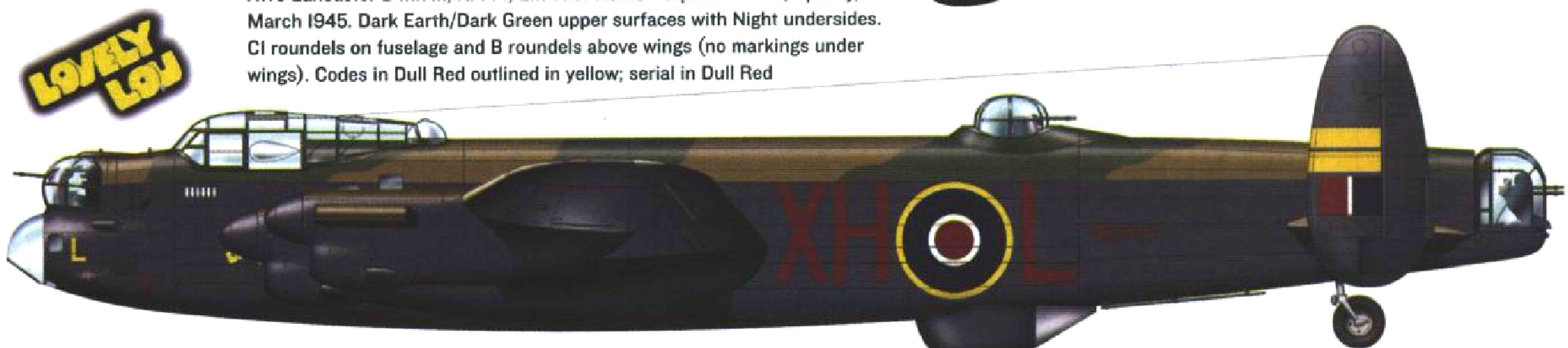
Below: Typical camouflage pattern of RAF Avro Lancasters Mk I and Mk III in Dark Earth and Dark Green



Above: Upper wing marking style for post-war Avro Lancasters (see TW900 on previous colour art page)

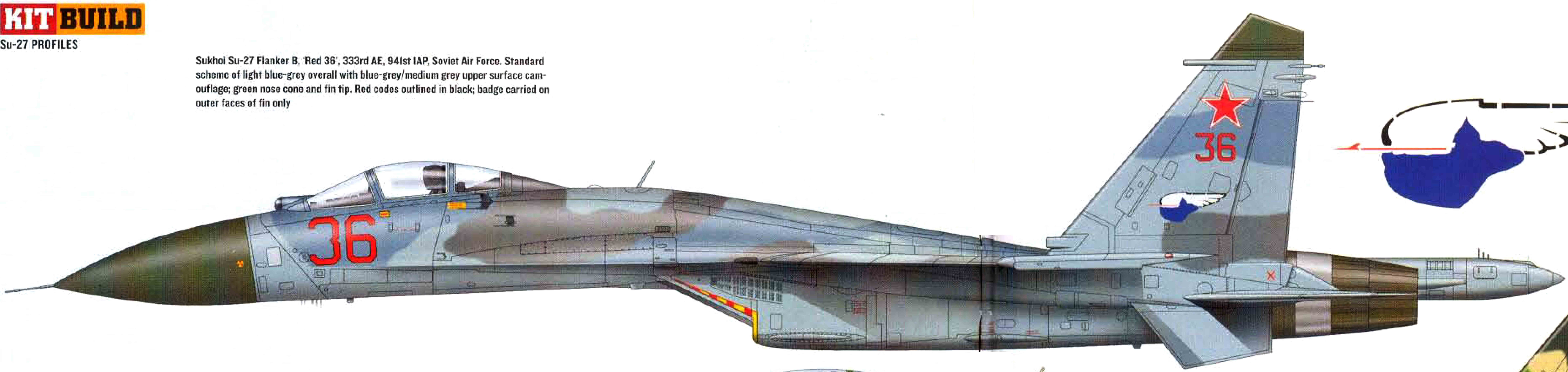
Above: Serial of Argentine Air Force carried above starboard wing of Avro Lancasters, with standard roundel on port. Serial, also in white, repeated under port wing, with roundel under starboard wing

Avro Lancaster B Mk III, RF144, EM•H of No.207 Squadron RAF, Spilsby, March 1945. Dark Earth/Dark Green upper surfaces with Night undersides. CI roundels on fuselage and B roundels above wings (no markings under wings). Codes in Dull Red outlined in yellow; serial in Dull Red



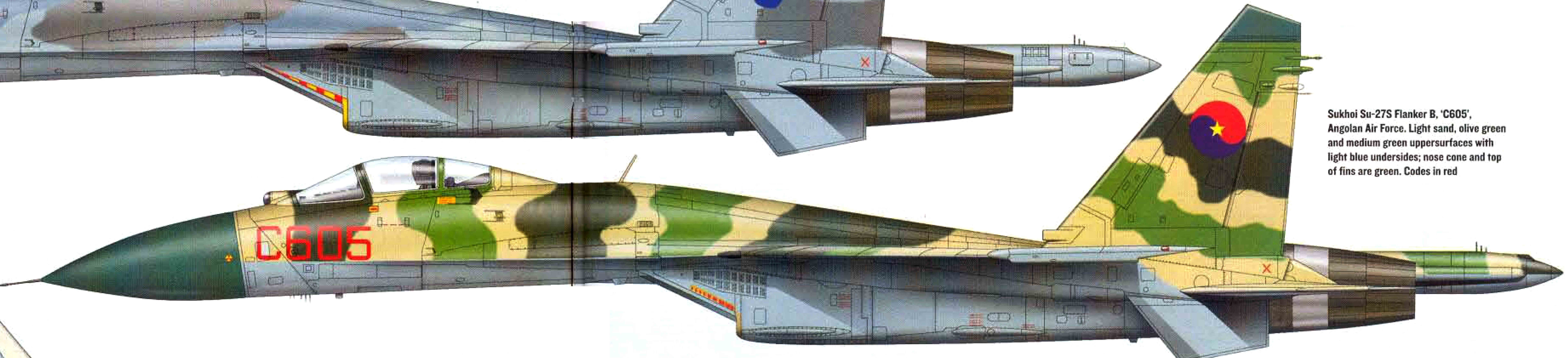
Avro Lancaster B Mk III, ME545, XH•L of No.218 Squadron RAF, Chedburgh, April 1945. Dark Earth/Dark Green upper surfaces with Night undersides. CI roundels on fuselage, B roundels above wings (no markings under wings). Code and serial in Dull Red, two horizontal bars in yellow on fins; 'L' repeated in yellow on nose. Note six mission markings in white, and just visible behind engine nacelles is the name 'LOVELY LOU'

Sukhoi Su-27 Flanker B, 'Red 36', 333rd AE, 941st IAP, Soviet Air Force. Standard scheme of light blue-grey overall with blue-grey/medium grey upper surface camouflage; green nose cone and fin tip. Red codes outlined in black; badge carried on outer faces of fin only



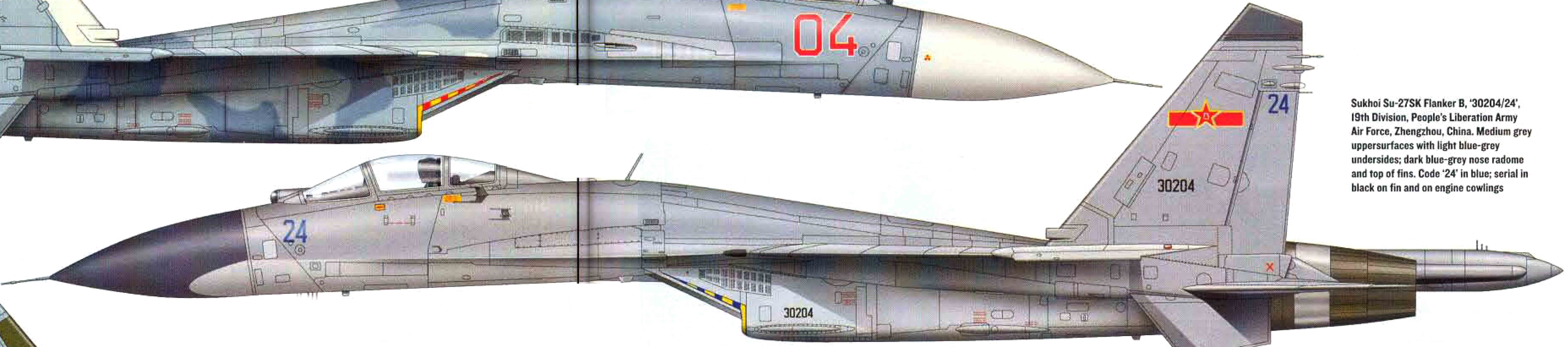
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2005

Sukhoi Su-27S Flanker B, 'C605', Angolan Air Force. Light sand, olive green and medium green uppersurfaces with light blue undersides; nose cone and top of fins are green. Codes in red

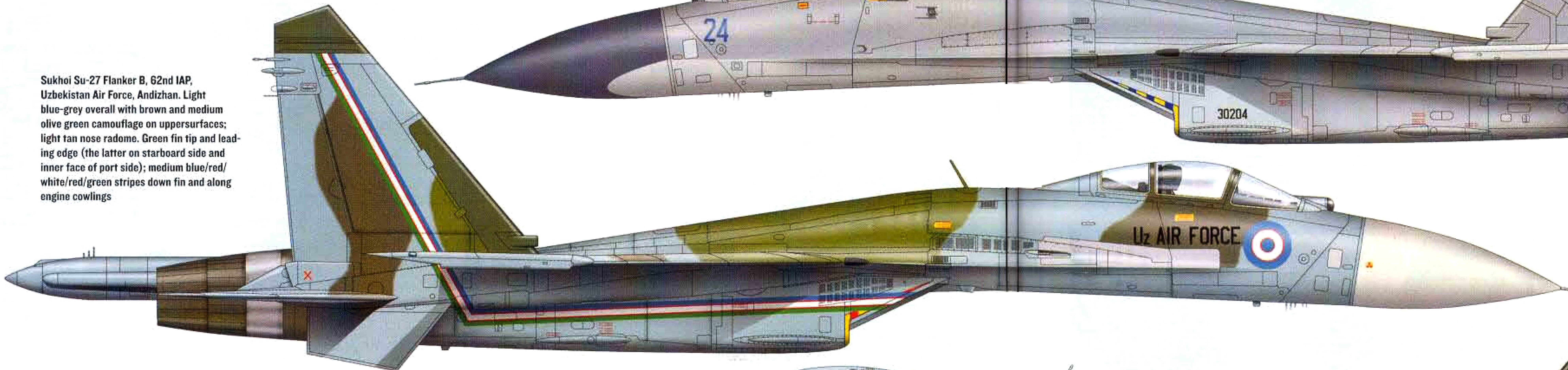


Sukhoi Su-27P, 'Red 04', 689th GvIAP, Chkalovsk, 2002. Standard three-tone finish in light blue, light blue-grey and blue-grey with off-white nose radome, top and leading edges of fin (starboard side and inner face of port side). Black eagle emblem on fin; red codes outlined in white

Sukhoi Su-27SK Flanker B, '30204/24', 19th Division, People's Liberation Army Air Force, Zhengzhou, China. Medium grey uppersurfaces with light blue-grey undersides; dark blue-grey nose radome and top of fins. Code '24' in blue; serial in black on fin and on engine cowlings



Sukhoi Su-27 Flanker B, 62nd IAP, Uzbekistan Air Force, Andizhan. Light blue-grey overall with brown and medium olive green camouflage on uppersurfaces; light tan nose radome. Green fin tip and leading edge (the latter on starboard side and inner face of port side); medium blue/red/white/red/green stripes down fin and along engine cowlings



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Sukhoi Su-27S Flanker B, '609', 6th Fighter Squadron, Eritrean Air Force, Asmara, 2003. Light grey overall with 'splinter' pattern camouflage in olive green and medium grey-green on upper surfaces; serial in black above national flag on fin

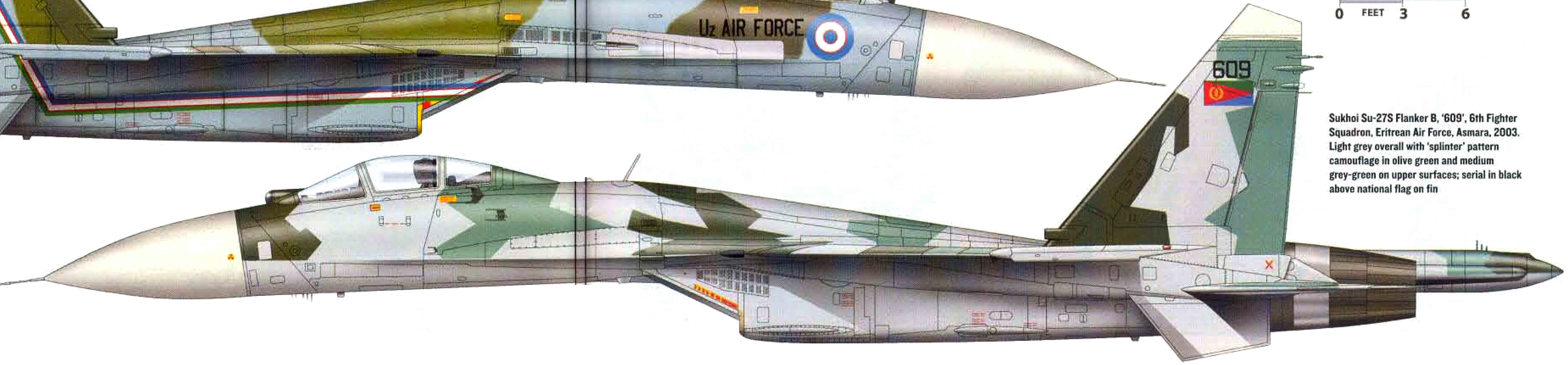


PHOTO ALBUM - SUKHOI Su-27

This selection of images shows a Su-27 of the Ukrainian Air Force photographed during the Czech International Air Fest at Brno in 2004.

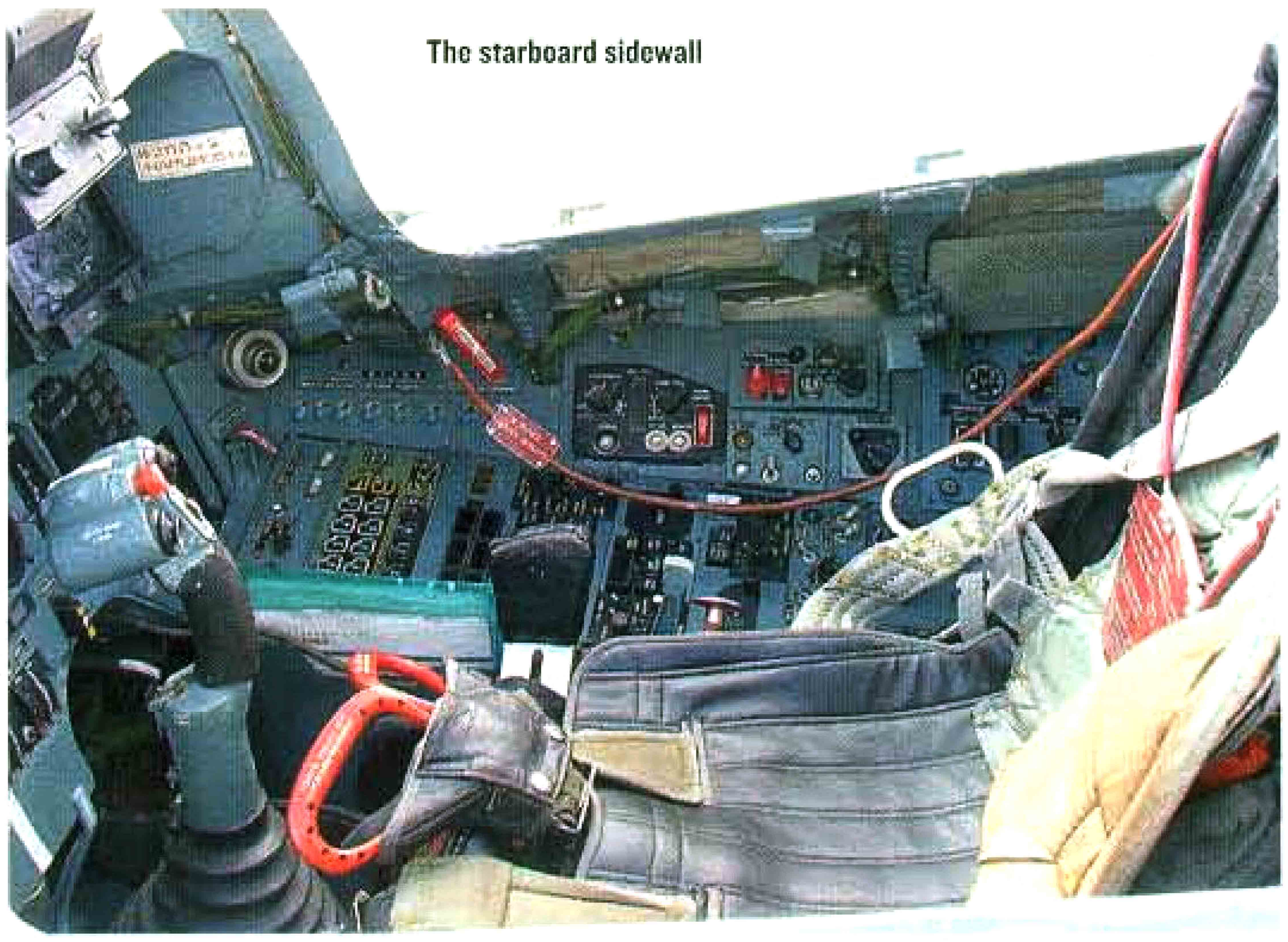
All photos ©Przemyslaw Skulski

COCKPIT

Overall view of the main instrument panel and HUD

The mid and upper sections of the K-36KM ejection seat

Very useful and often unseen view up underneath the rear cockpit canopy section

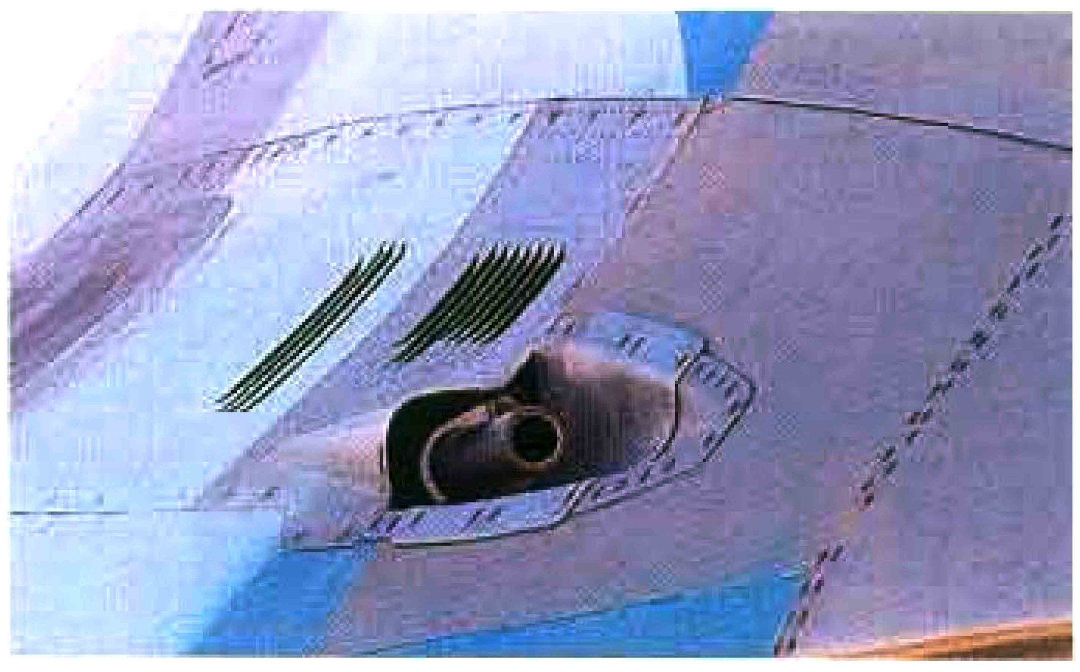


The starboard sidewall

FUSELAGE & TAIL

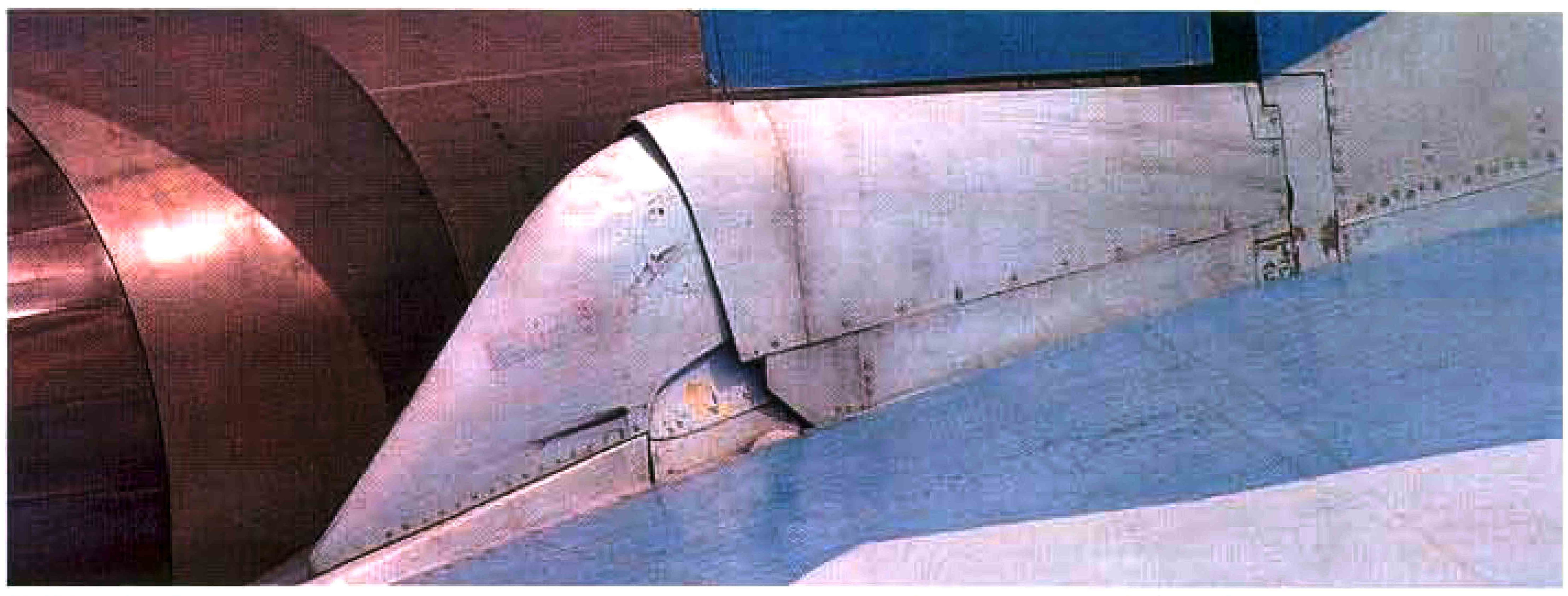
An overall view of the vertical fin showing the wear and dirt accumulation in this area and the various antennae on the top, trailing edge of the fin

Not a view you get to see that often, this shot looking forward underneath the fuselage does allow you to see the pylon in this area

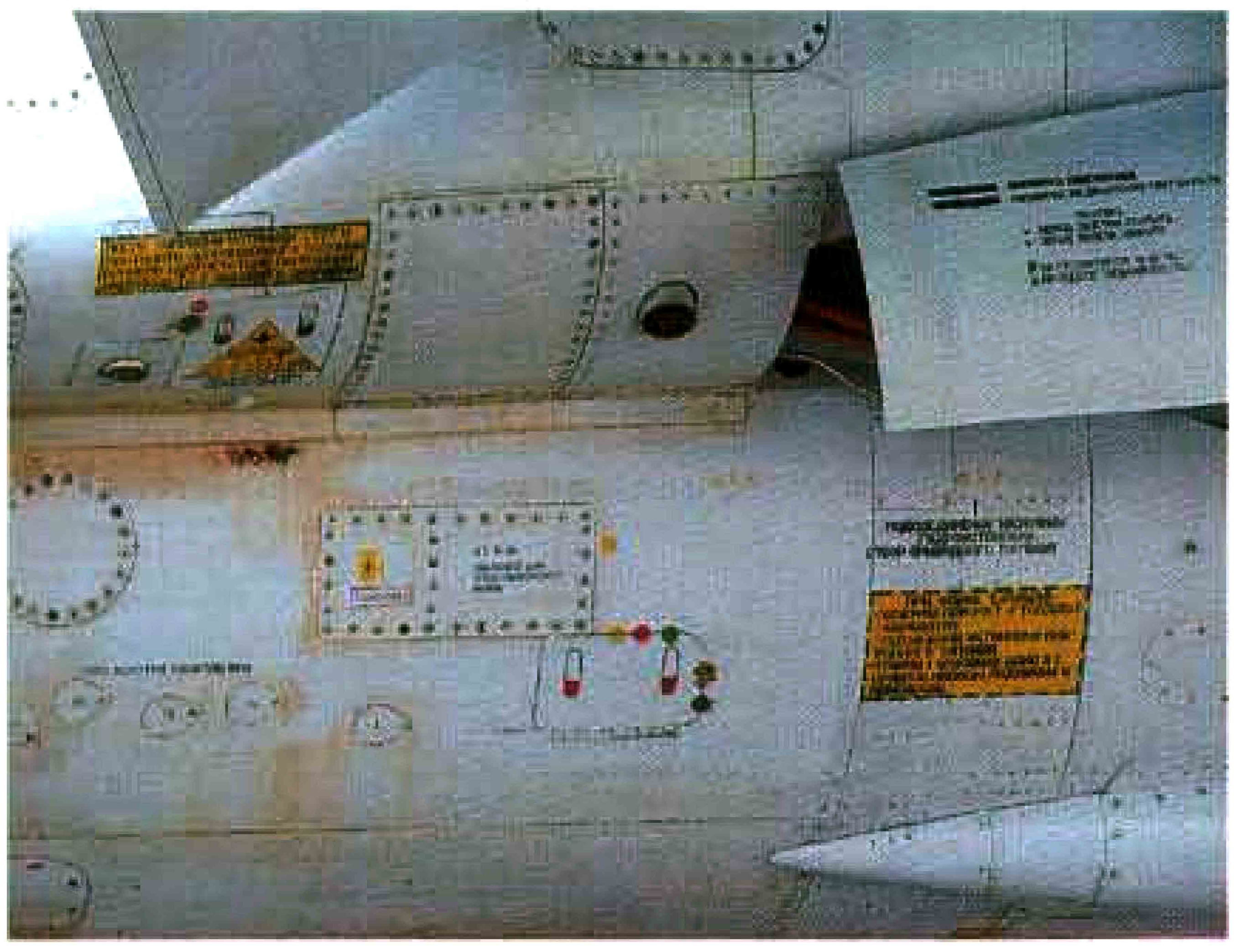


The gun barrel and metal cover in the starboard mid-fuselage side

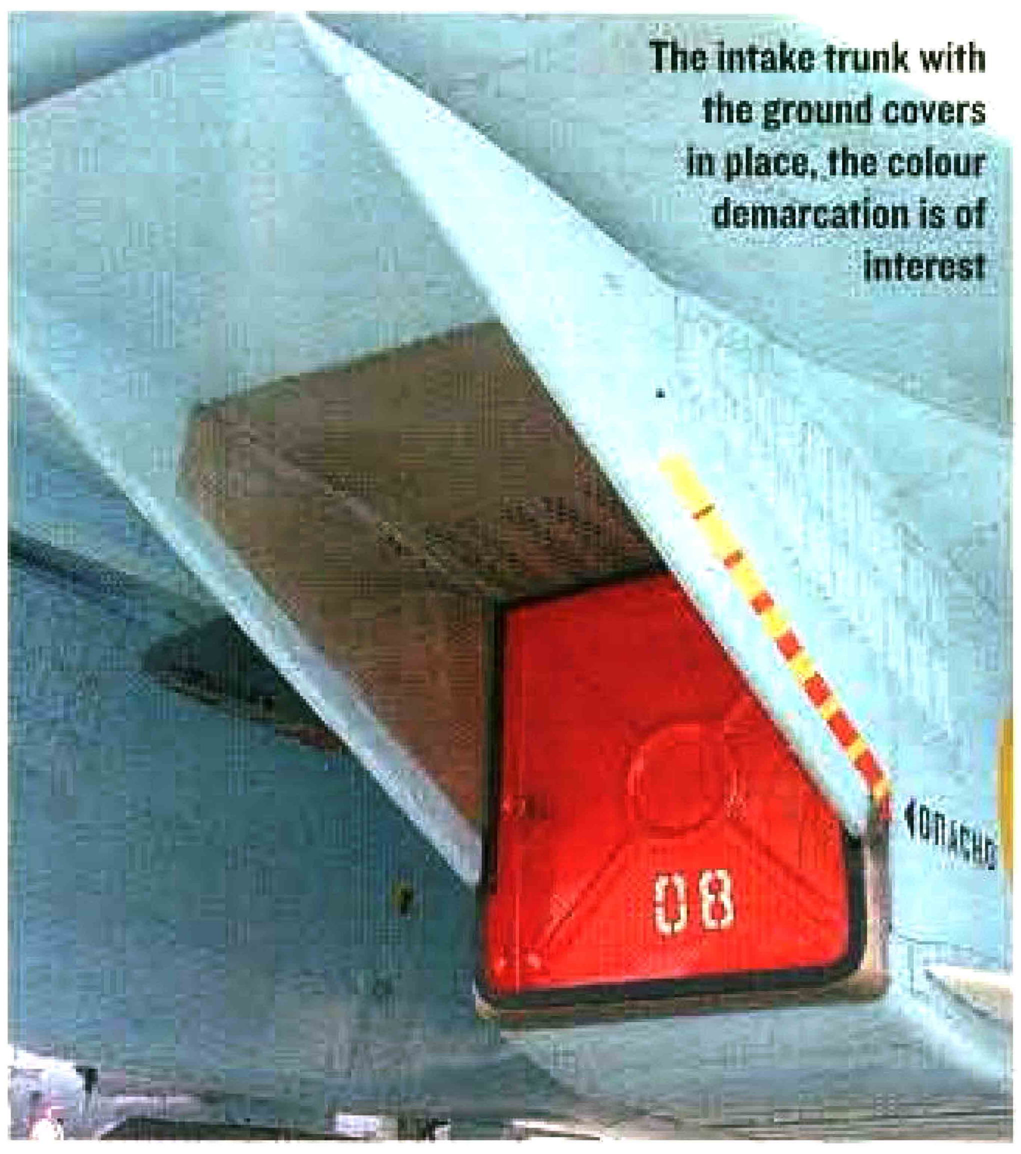
An overall view of the mid-starboard side. Just how few panel lines can you see!



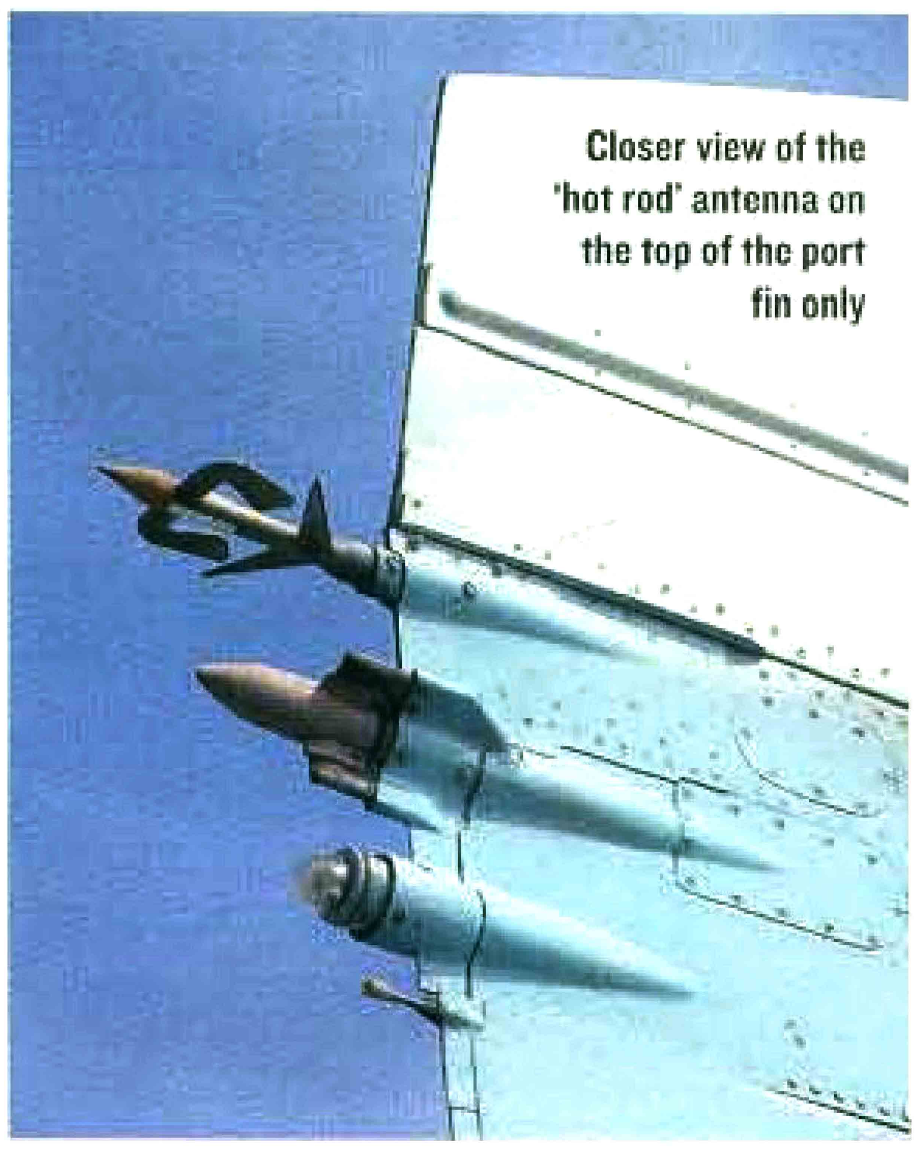
The hinge for the tailerons is covered by this fairing, it is an area often overlooked from a weathering standpoint



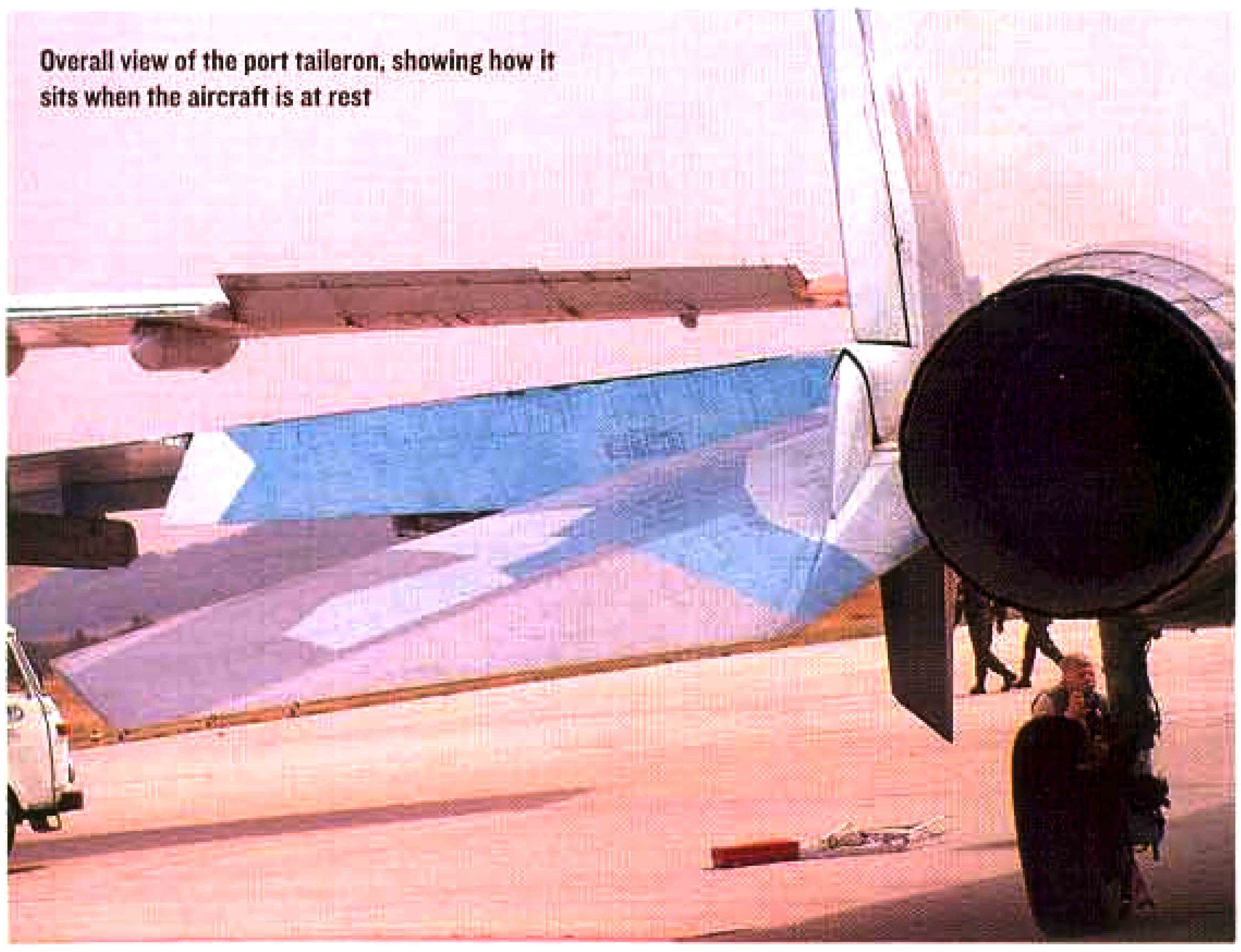
This is the lower fuselage side, just below and aft of the wing trailing edge. The weathering and numerous stencils are noteworthy



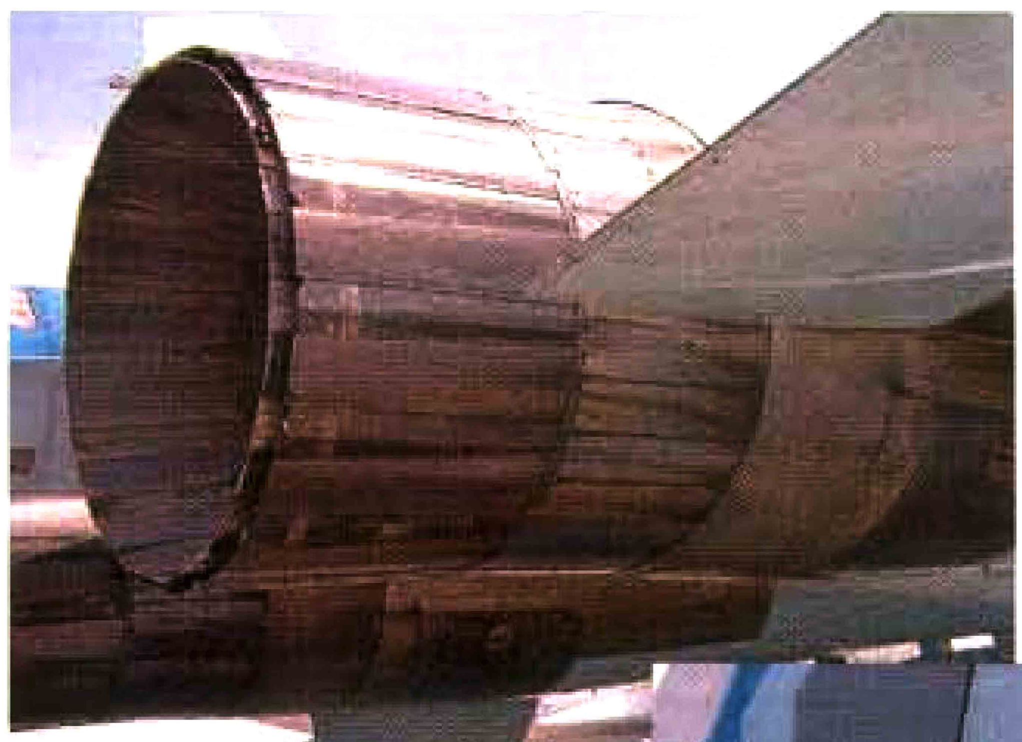
The intake trunk with the ground covers in place, the colour demarcation is of interest



Closer view of the 'hot rod' antenna on the top of the port fin only



Overall view of the port taileron, showing how it sits when the aircraft is at rest

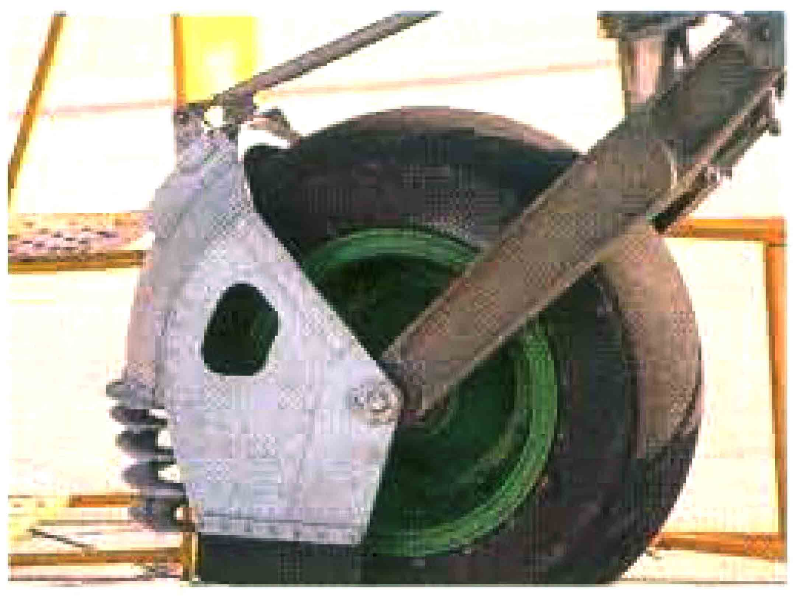


A view underneath the starboard engine exhaust, just look at all those colours!

This view of the upper section of the port engine goes to show just how 'blue' the exhaust cans get

UNDERCARRIAGE

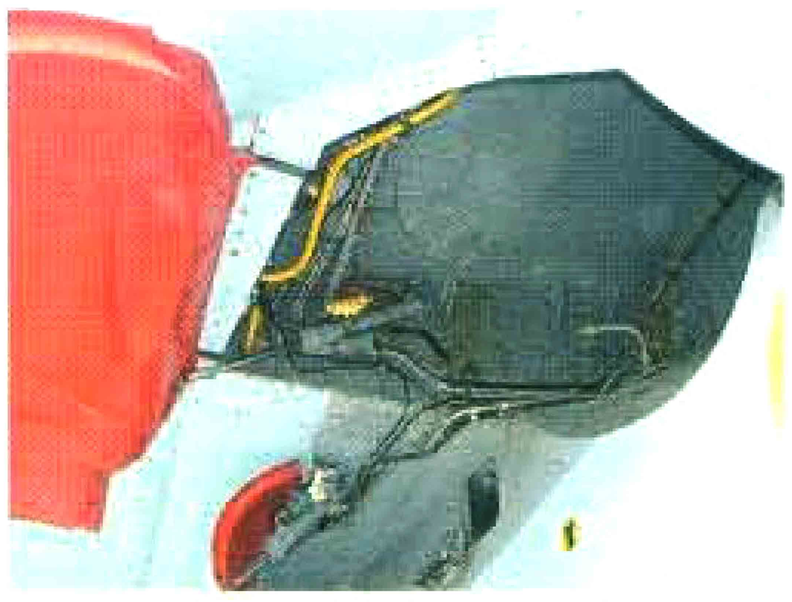
Overall view of the nose oleo assembly showing just how complex this item is



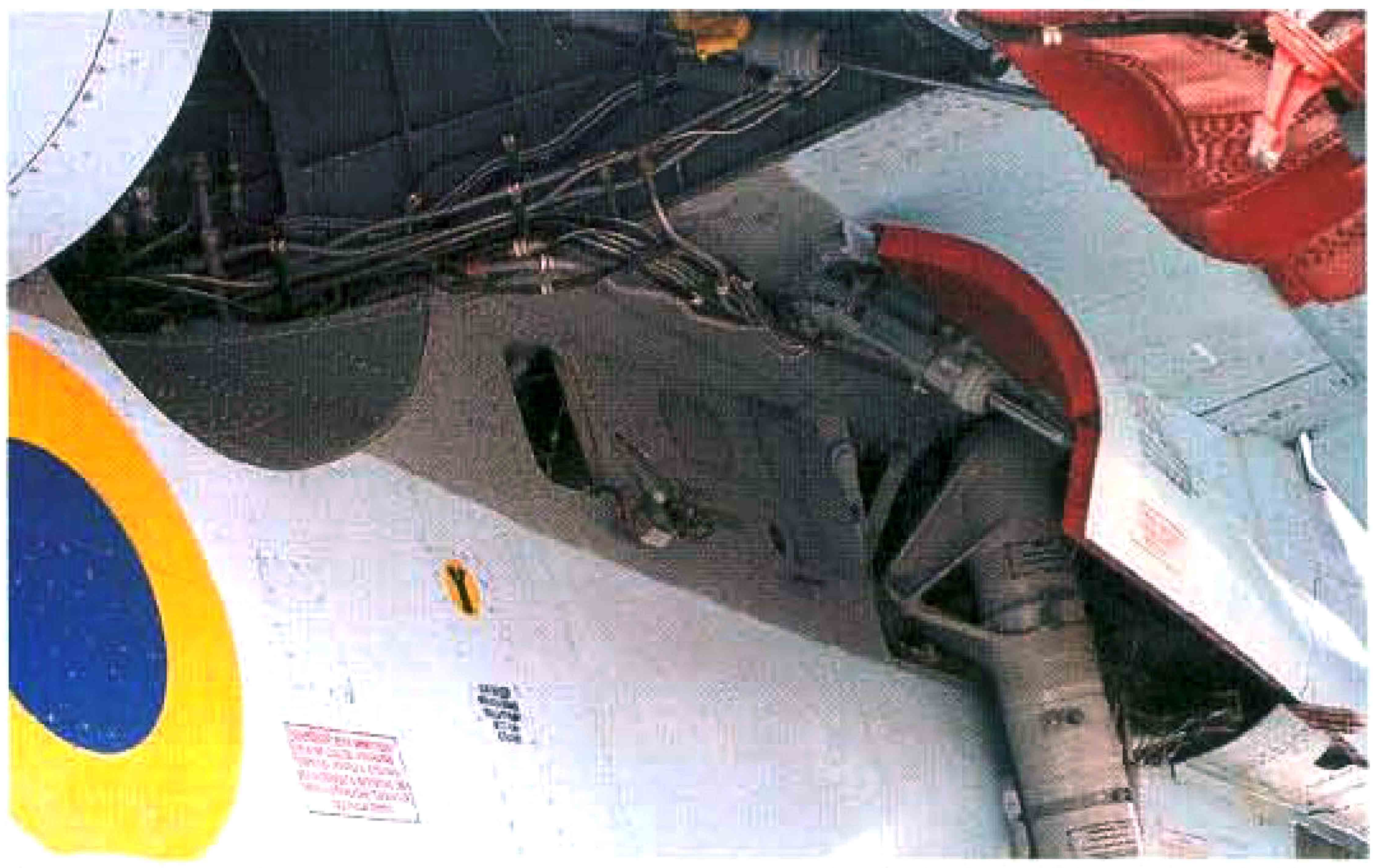
A closer view of the mudguard and wheel of the nose oleo

A look back down into the whole main undercarriage area where you can see just how far out those main doors hang!

The rear face of the main undercarriage tyre and wheel unit with all its various electrical and hydraulic pipework



A look up into the port main undercarriage bay with the red interiors to the ‚moving' parts and all that pipework

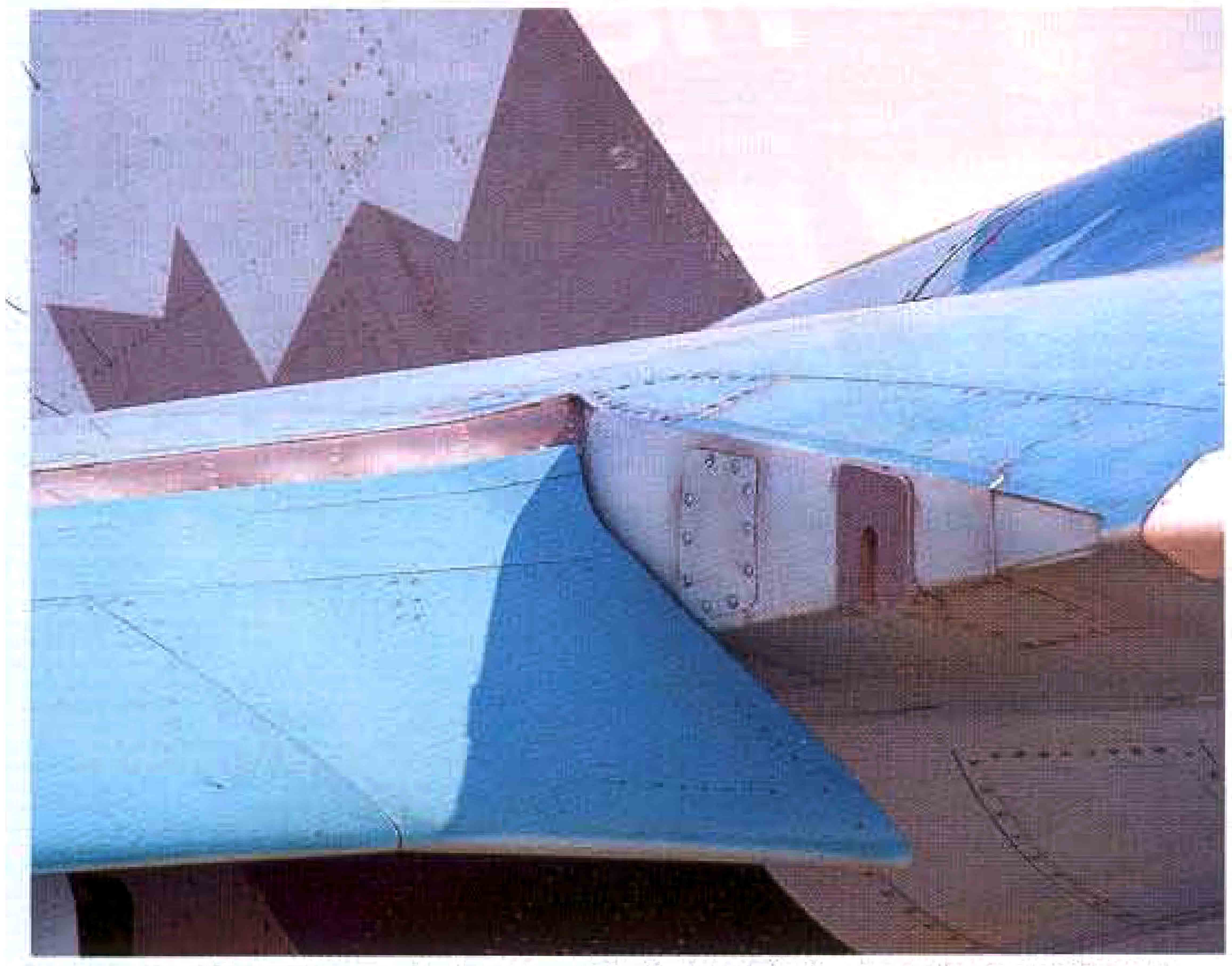


The aft section of the main undercarriage bay, with the top of the main oleo leg, its anchor point and the smaller door

WINGS

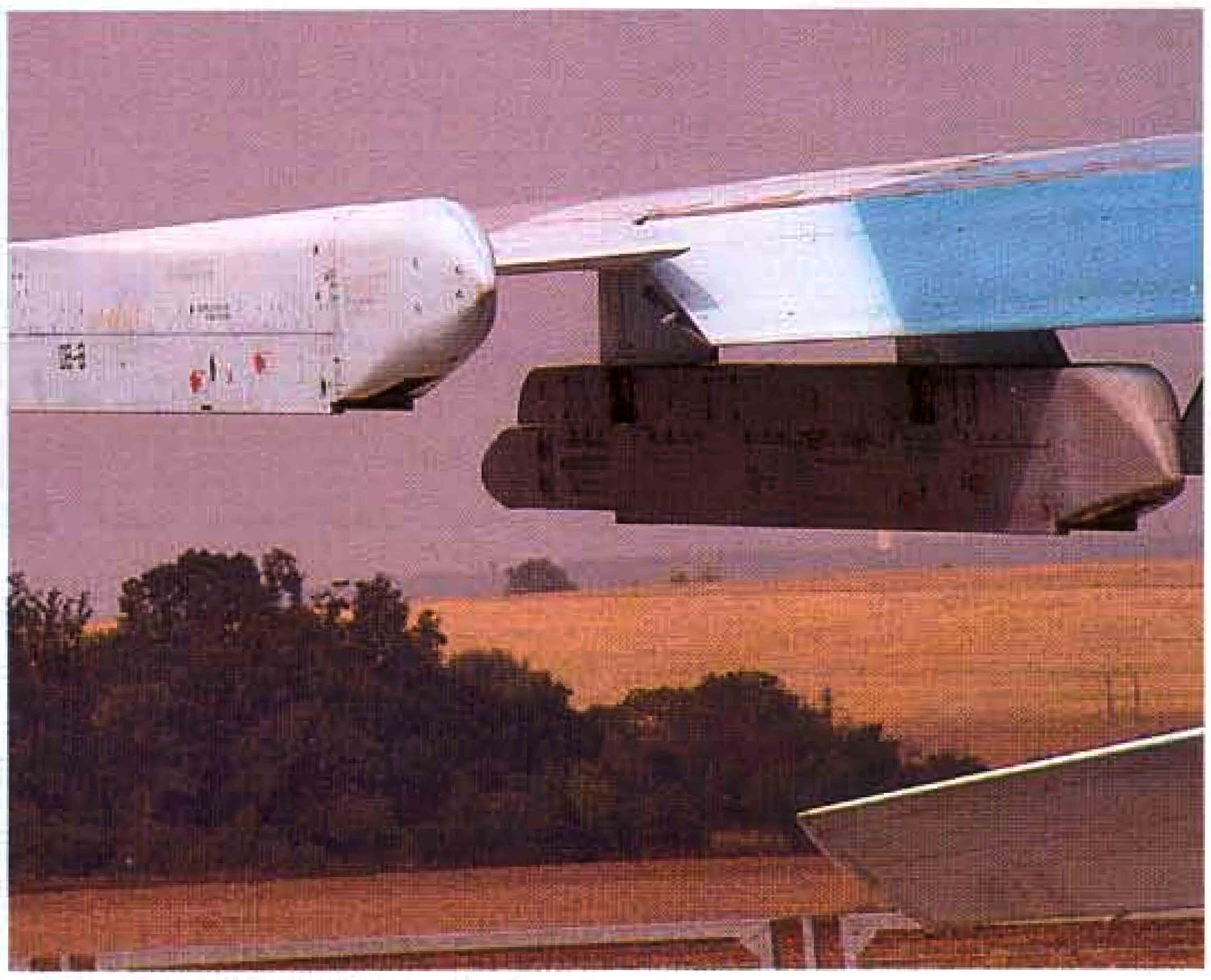
Both of the underwing pylons viewed from behind

This is the mid-span pylon under the starboard wing



A closer view of the structure on the inner face of the fuselage/wing juncture when the leading edge slats are down

The inboard section of the leading edge of the starboard wing, showing the slats in the down position



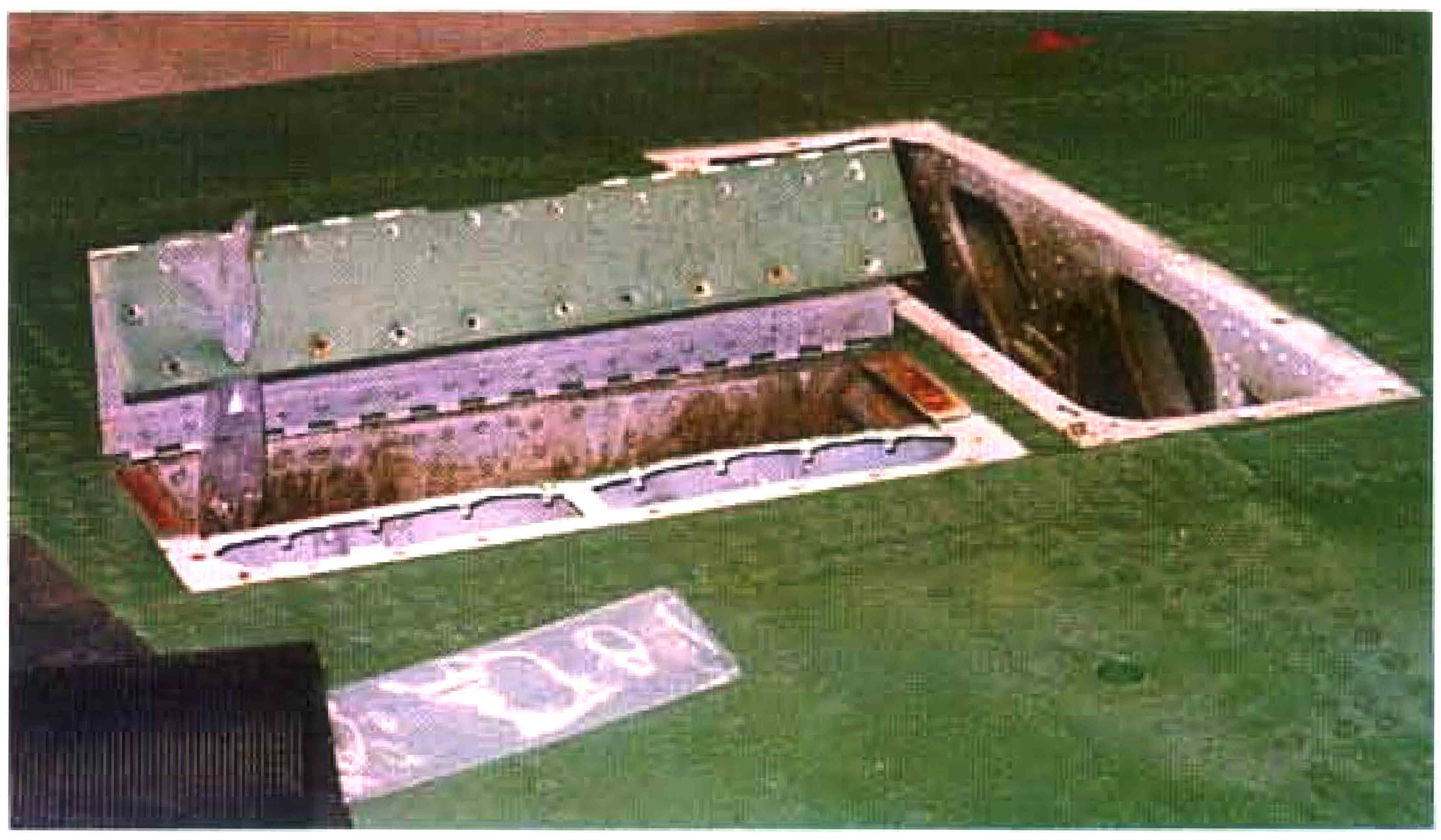
Overall view of the wing tip and outboard pylons

The pylon carried at mid-span. This is the one under the port wing

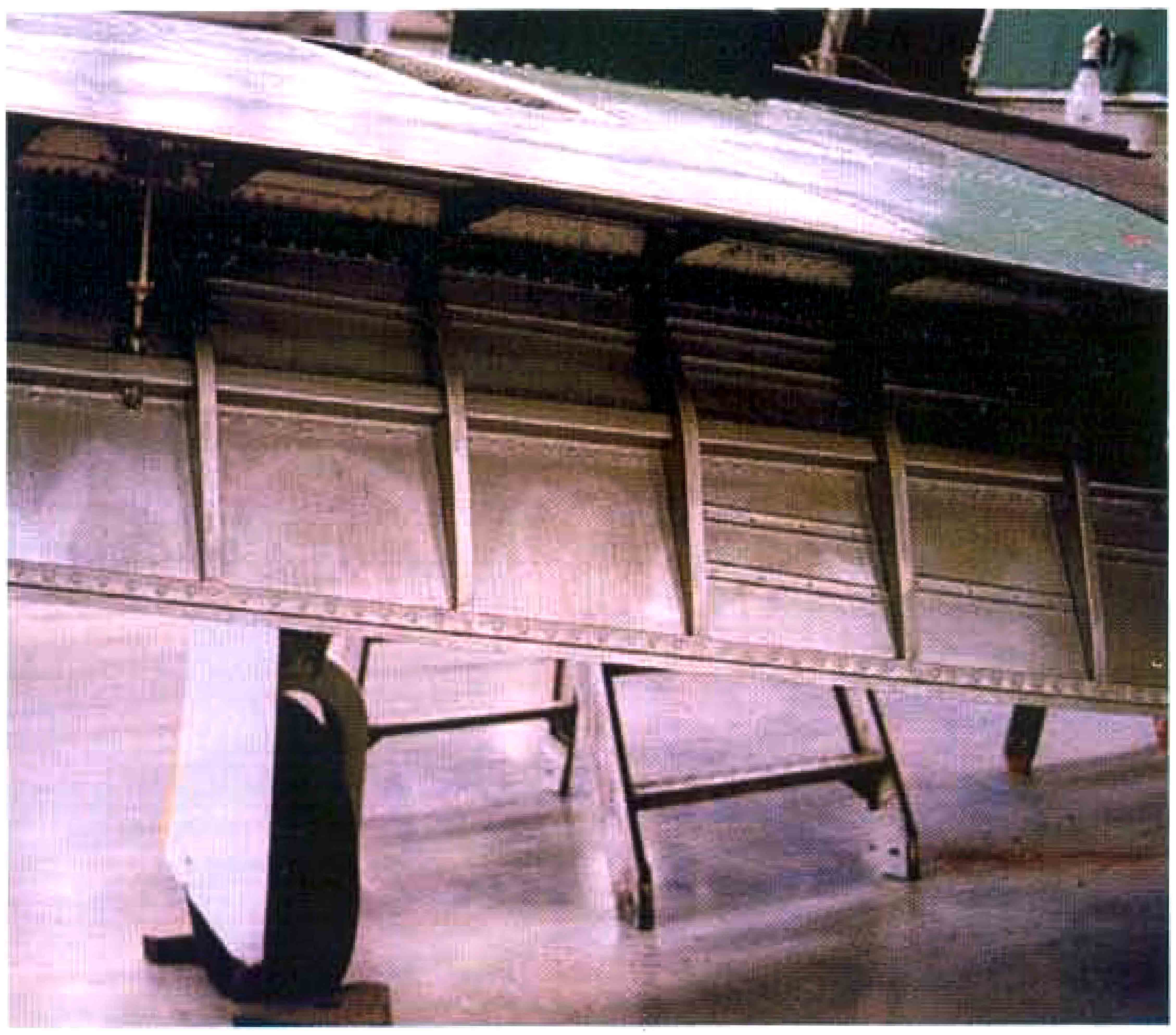
PHOTO ALBUM

Ki-100-Ib - All photos © R.A. Franks

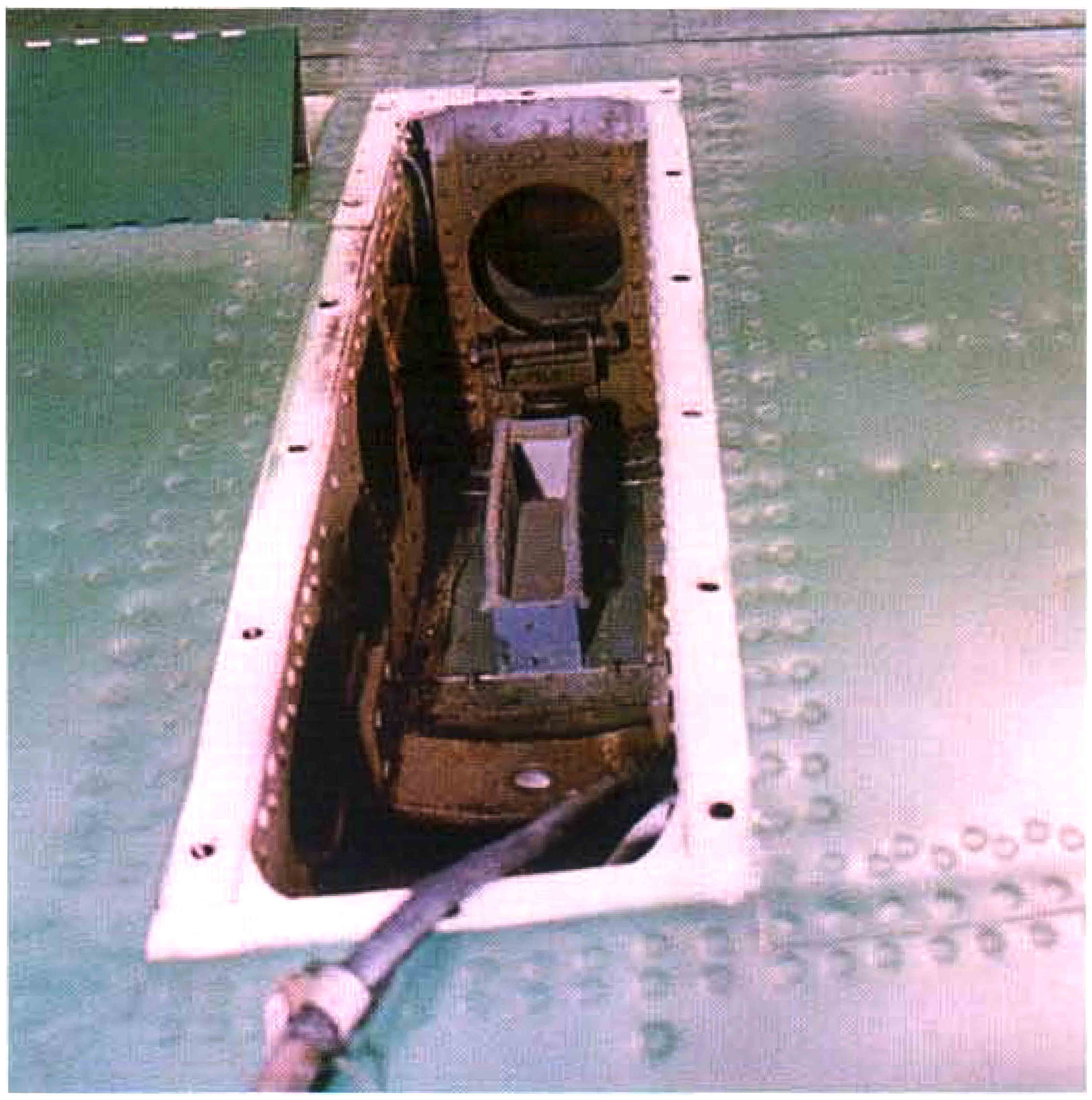
Only a very few Ki-61s exist in the world today, most of them incomplete wrecks in the process of being restored. The only complete one rests in Japan, so was a bit too far away for us to pop across and photograph it! As it shares the same wings and rear fuselage as the Ki-61, this selection of images shows the Ki-100-Ib, the world's only example that for many years was displayed at Cosford. A few years ago it made its way to the main RAF Museum site at Hendon, where it resides today to represent Japanese fighter development in place of the A6M Zero, an example of which the RAF Museum does not have.



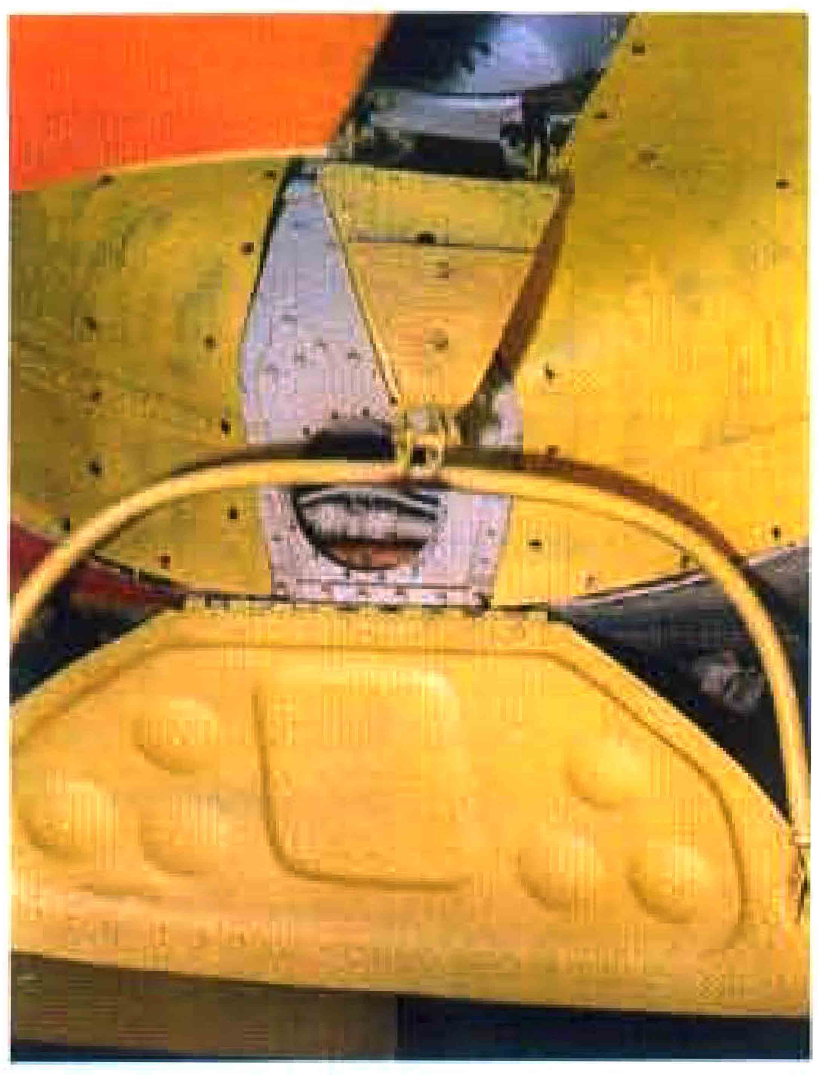
The ammunition access panels in the wing, with their piano hinge and double-fold



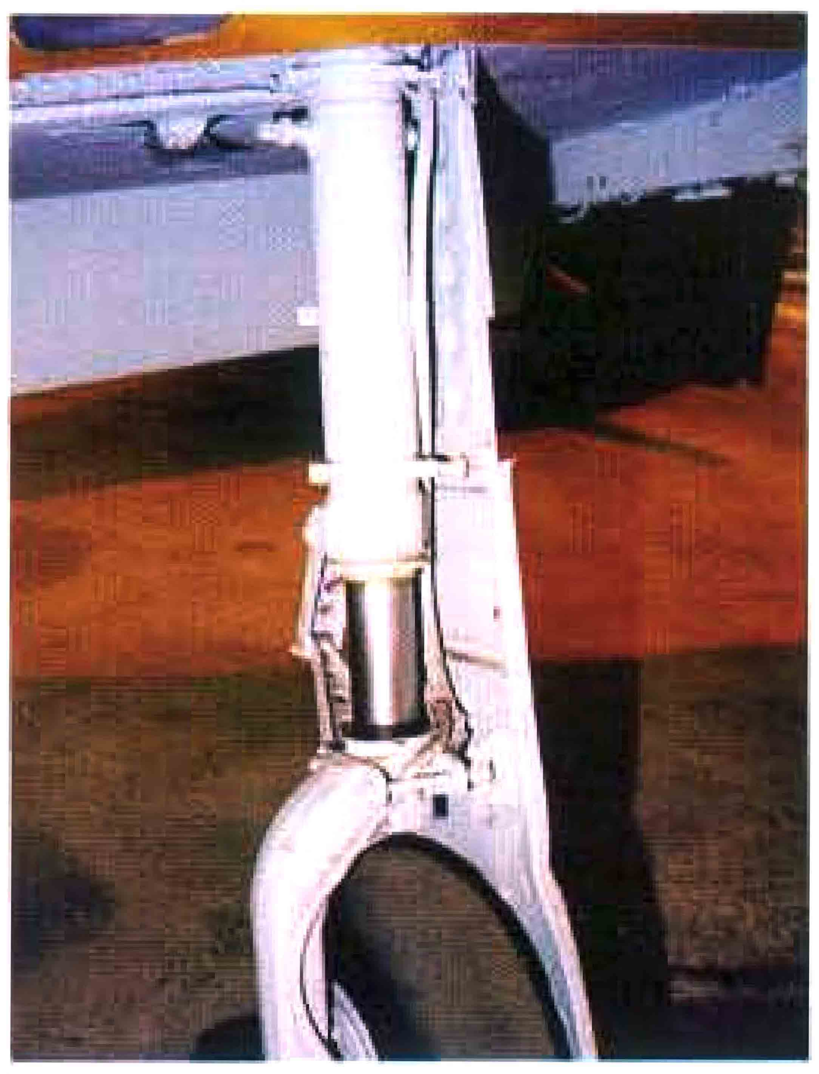
The flap unit under the port wing, viewed from behind



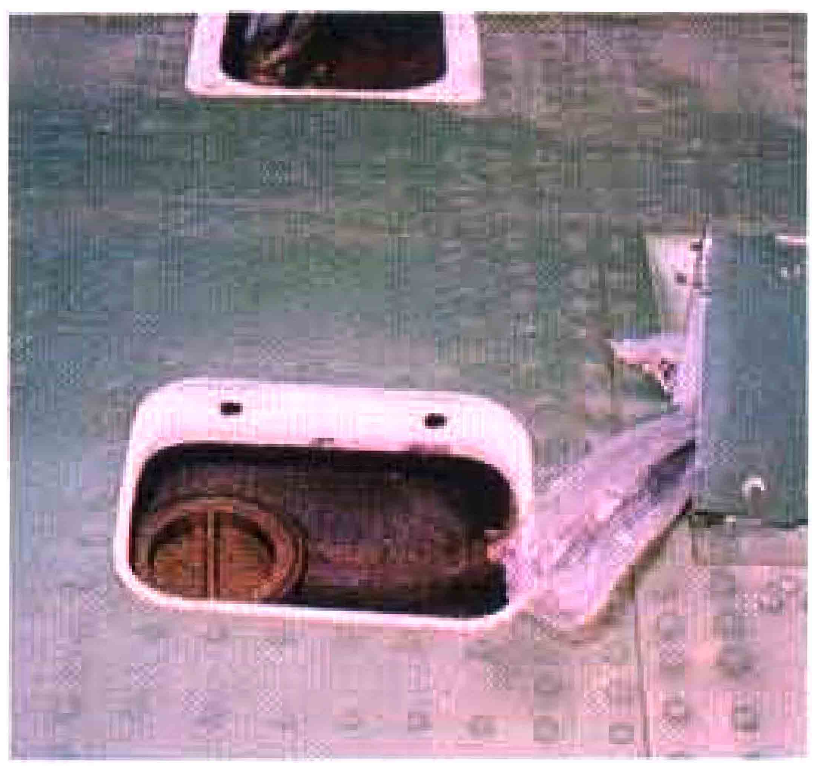
The interior of the wing-mounted machine-gun bays, devoid of the weapon in this instance, and so showing the internal structure



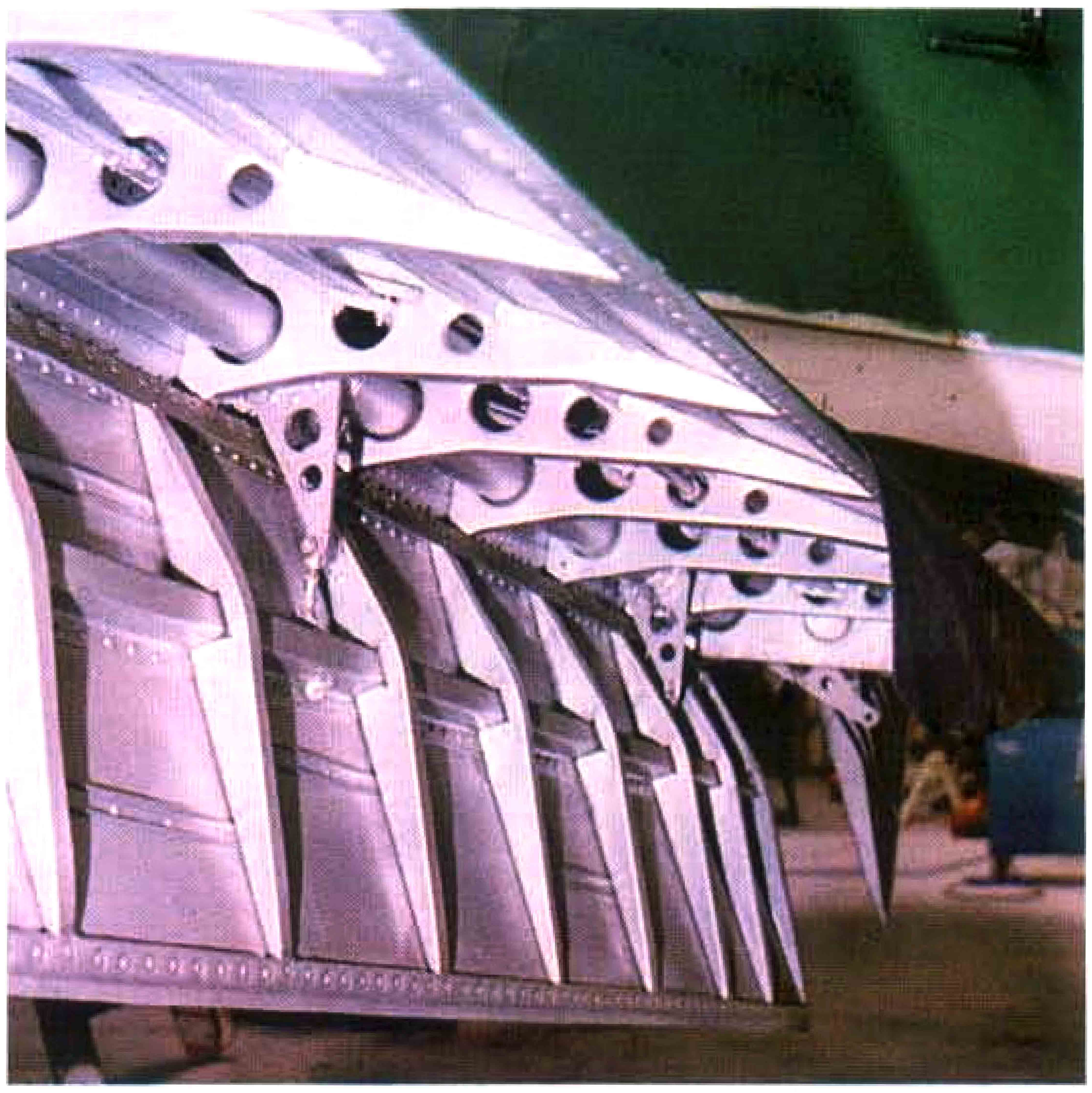
The door hinge for the inner undercarriage door. This unit is not powered and is operated simply by the retracting wheel striking it (note the wooden block at the centre) and forcing the unit to collapse and thus draw the door shut. Ignore the colour, it is Zinc Chromate primer



The main oleo leg unit and wheel assembly, viewed from the front



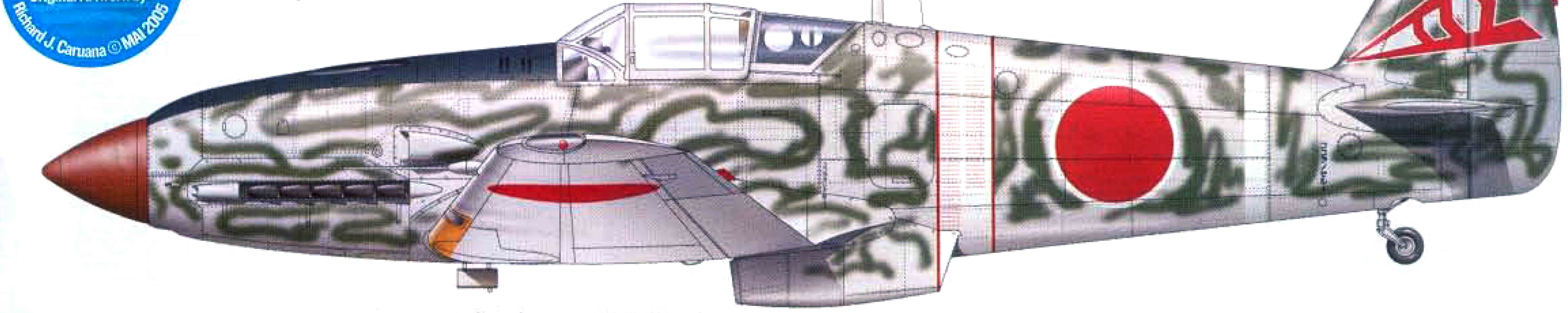
The access cover removed from the fuel filler, inboard of the ammunition access panel on the starboard wing



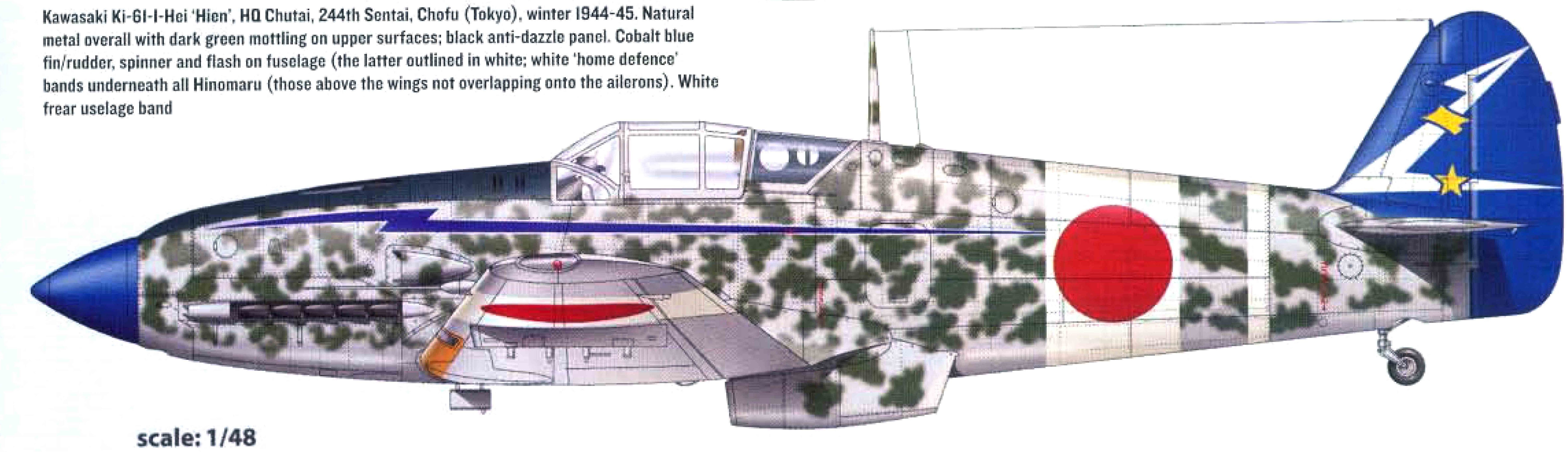
A more detailed look along the flap, showing the rib detail and actuating rod and linkage

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2005

Kawasaki Ki-61-I-Otsu, 2nd Chutai, 68 Sentai. Natural metal overall with black anti-dazzle panel; dark green applied in streaks over upper surface areas. White band, outlined red, and having red insciptions around fuselage aft of cockpit; white band around rear fuselage. Unit marking in red and white; reddish-brown spinner



Kawasaki Ki-61-I-Hei 'Hien', HQ Chutai, 244th Sentai, Chofu (Tokyo), winter 1944-45. Natural metal overall with dark green mottling on upper surfaces; black anti-dazzle panel. Cobalt blue fin/rudder, spinner and flash on fuselage (the latter outlined in white; white 'home defence' bands underneath all Hinomaru (those above the wings not overlapping onto the ailerons). White frear uselage band



scale: 1/48

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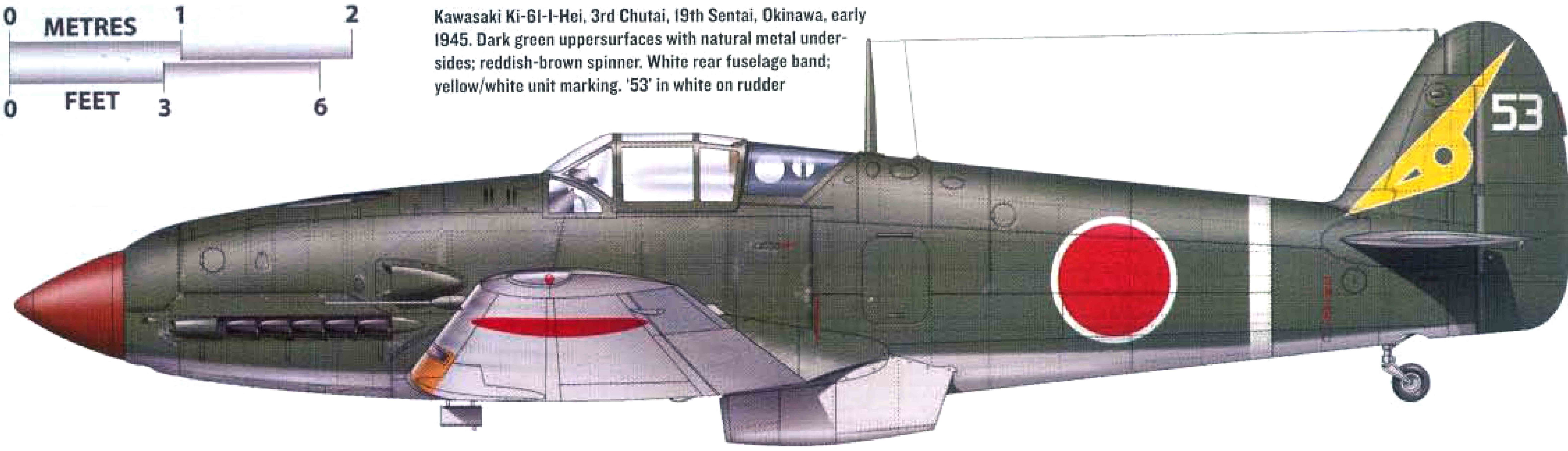
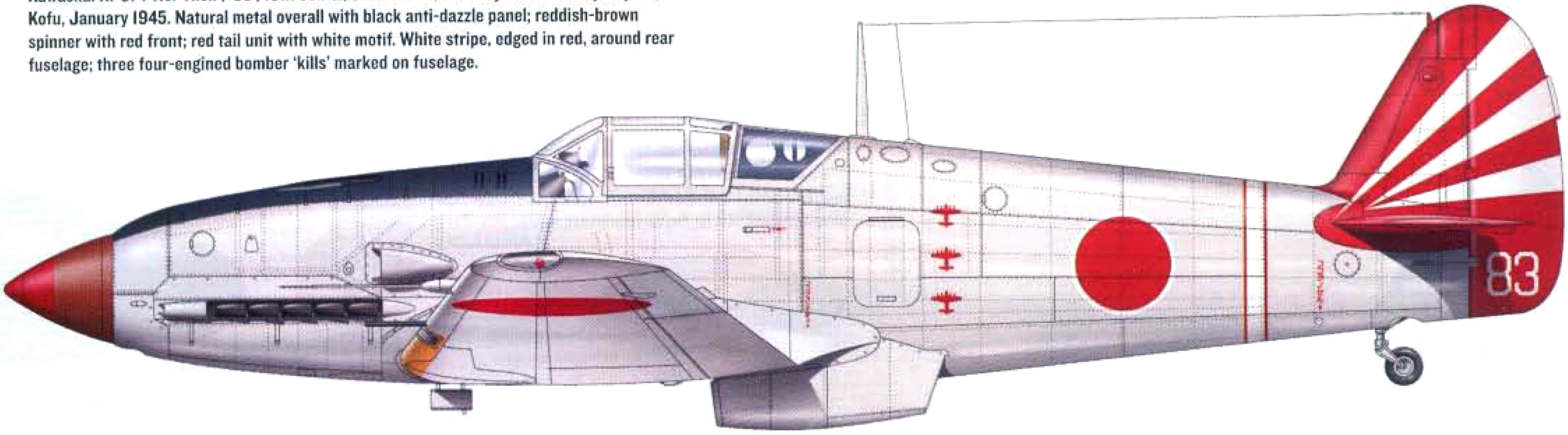
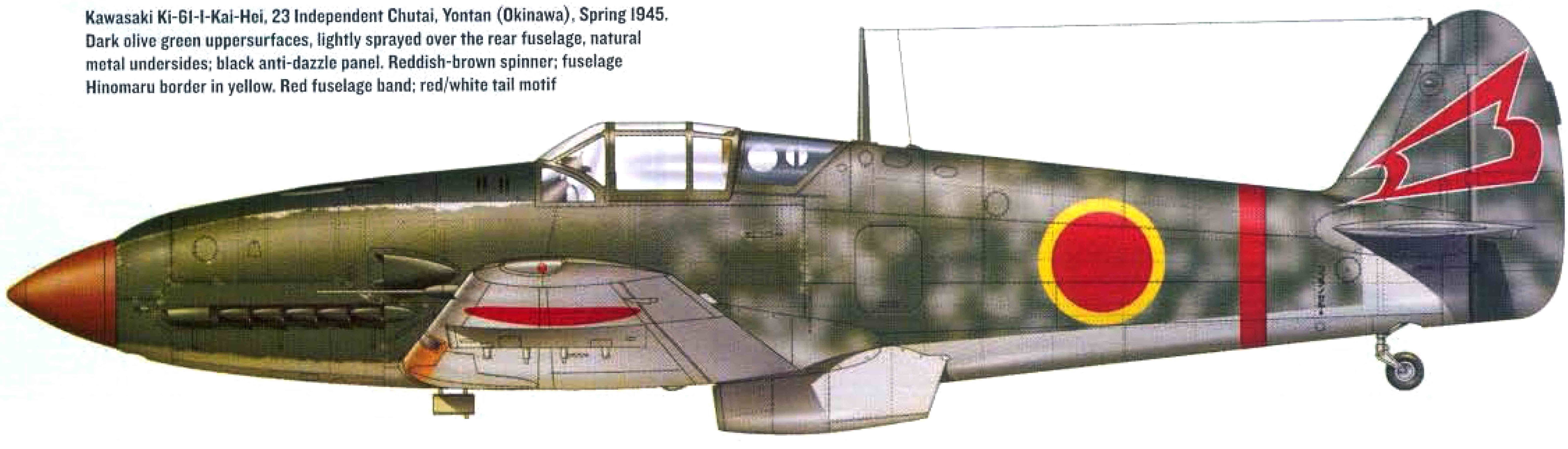
Kawasaki Ki-61-I-Hei, 3rd Chutai, 19th Sentai, Okinawa, early 1945. Dark green uppersurfaces with natural metal undersides; reddish-brown spinner. White rear fuselage band; yellow/white unit marking. '53' in white on rudder



Kawasakai Ki-61-I-Hei 'Hien', '83', 18th Sentai/6th Shinten, flown by 1st Lt. Mitsuyo Oyake, Kofu, January 1945. Natural metal overall with black anti-dazzle panel; reddish-brown spinner with red front; red tail unit with white motif. White stripe, edged in red, around rear fuselage; three four-engined bomber 'kills' marked on fuselage.

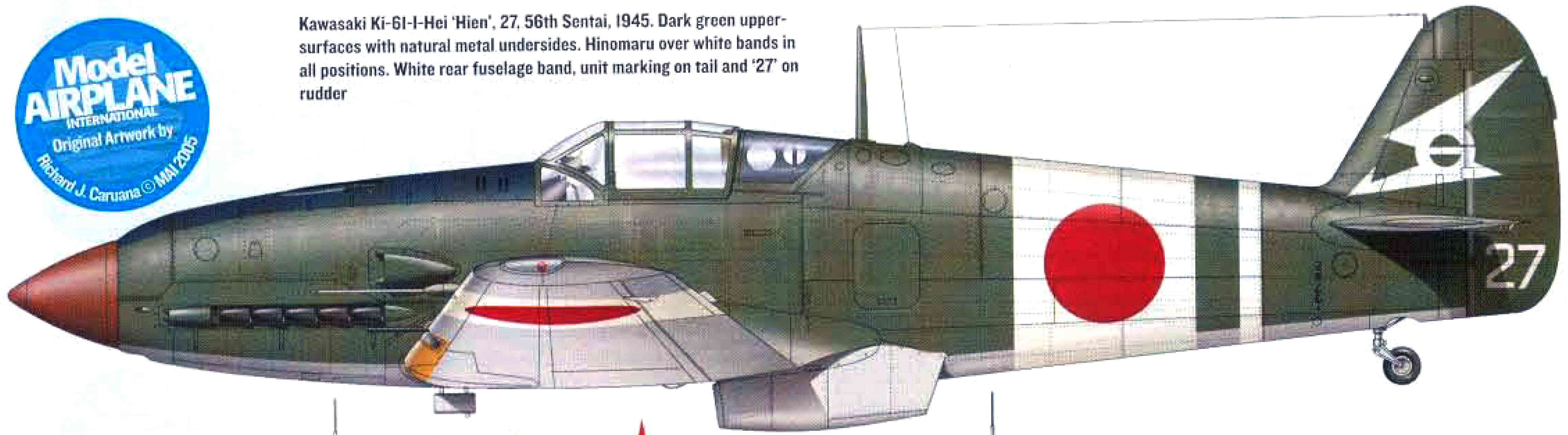


Kawasaki Ki-61-I-Kai-Hei, 23 Independent Chutai, Yontan (Okinawa), Spring 1945. Dark olive green uppersurfaces, lightly sprayed over the rear fuselage, natural metal undersides; black anti-dazzle panel. Reddish-brown spinner; fuselage Hinomaru border in yellow. Red fuselage band; red/white tail motif

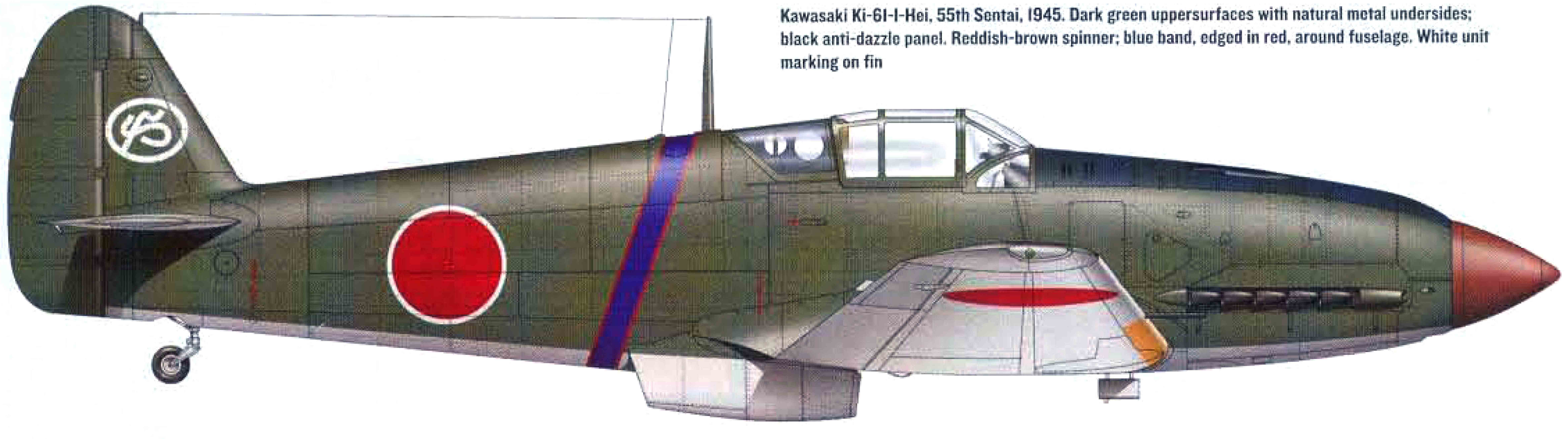


Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2005

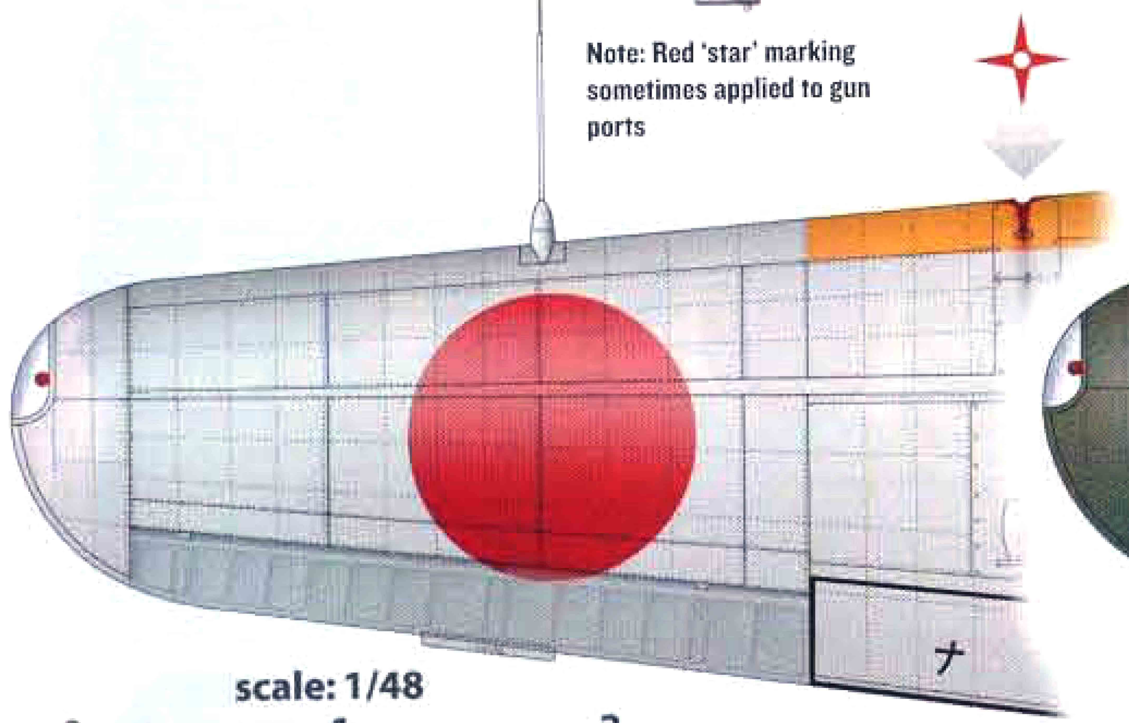
Kawasaki Ki-61-I-Hei 'Hien', 27, 56th Sentai, 1945. Dark green uppersurfaces with natural metal undersides. Hinomaru over white bands in all positions. White rear fuselage band, unit marking on tail and '27' on rudder

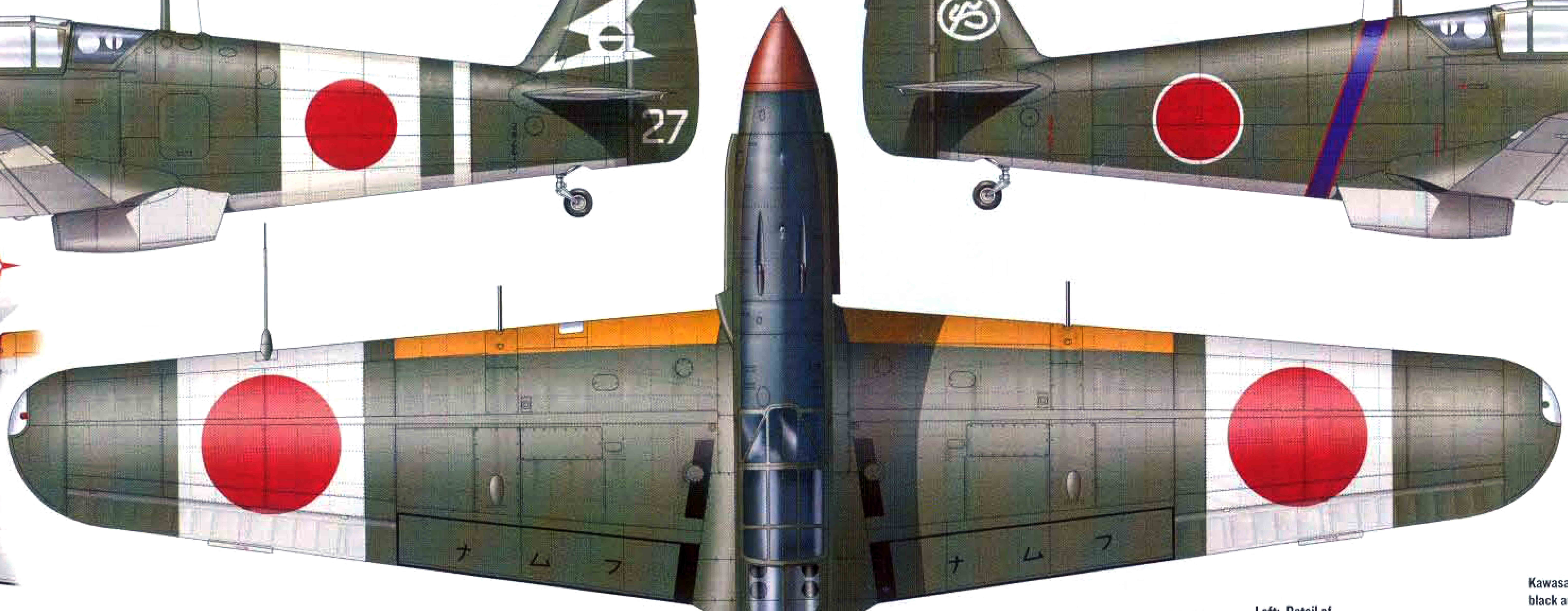


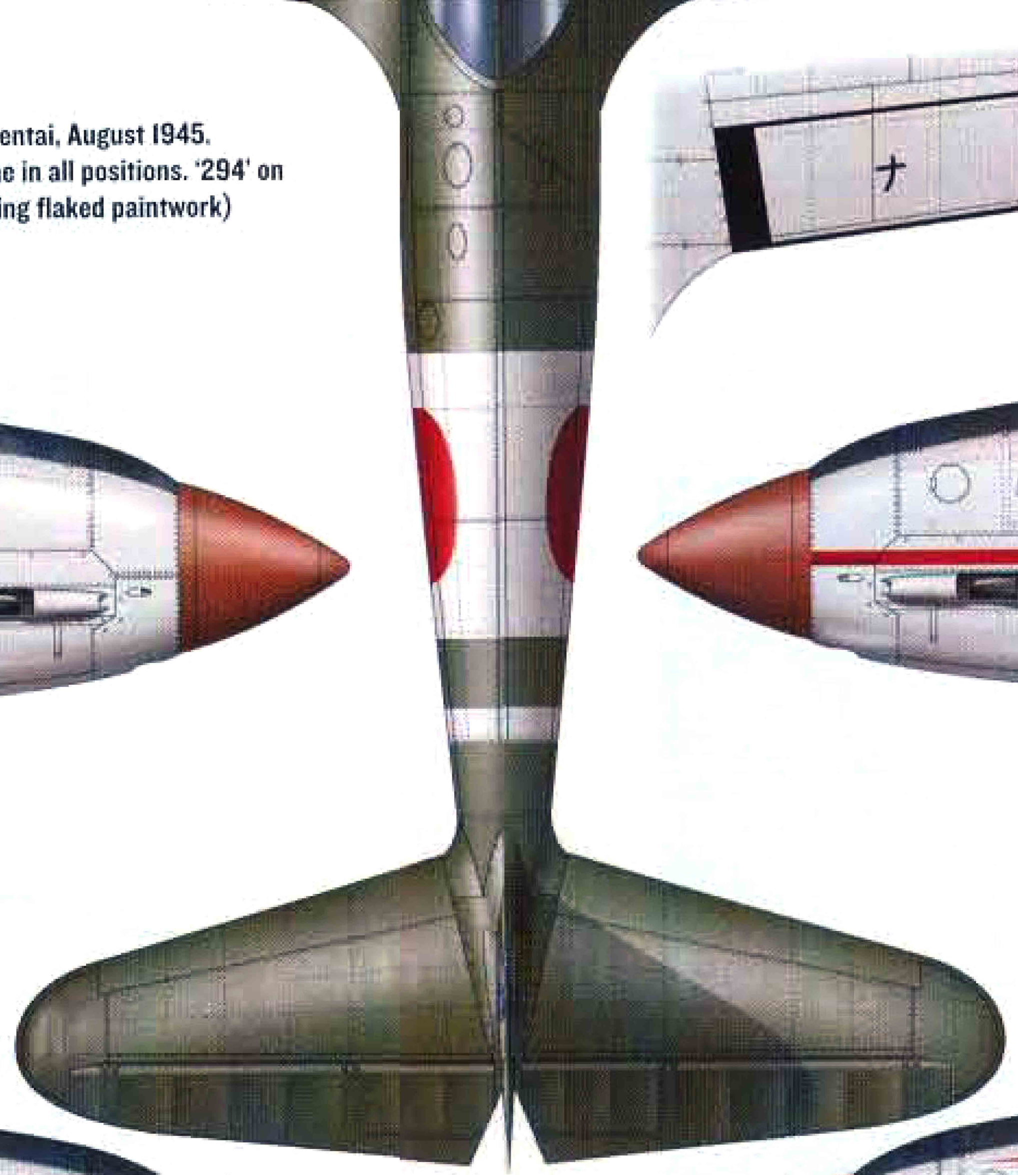
Kawasaki Ki-61-I-Hei, 55th Sentai, 1945. Dark green uppersurfaces with natural metal undersides; black anti-dazzle panel. Reddish-brown spinner; blue band, edged in red, around fuselage. White unit marking on fin



Note: Red 'star' marking sometimes applied to gun ports



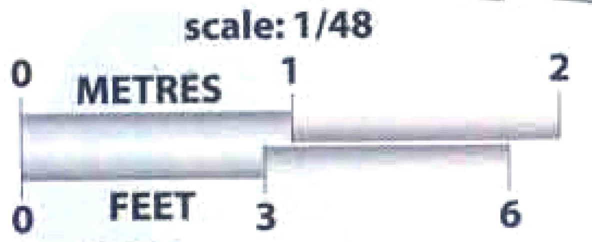




General Note
Canvas-covered areas (ailerons, rudder, elevators) were usually painted in light grey-green when aircraft were delivered in natural metal finish (see scrap view far left). A black anti-dazzle panel was also added and sometimes this was retained when aircraft were painted in dark green on uppersurfaces.

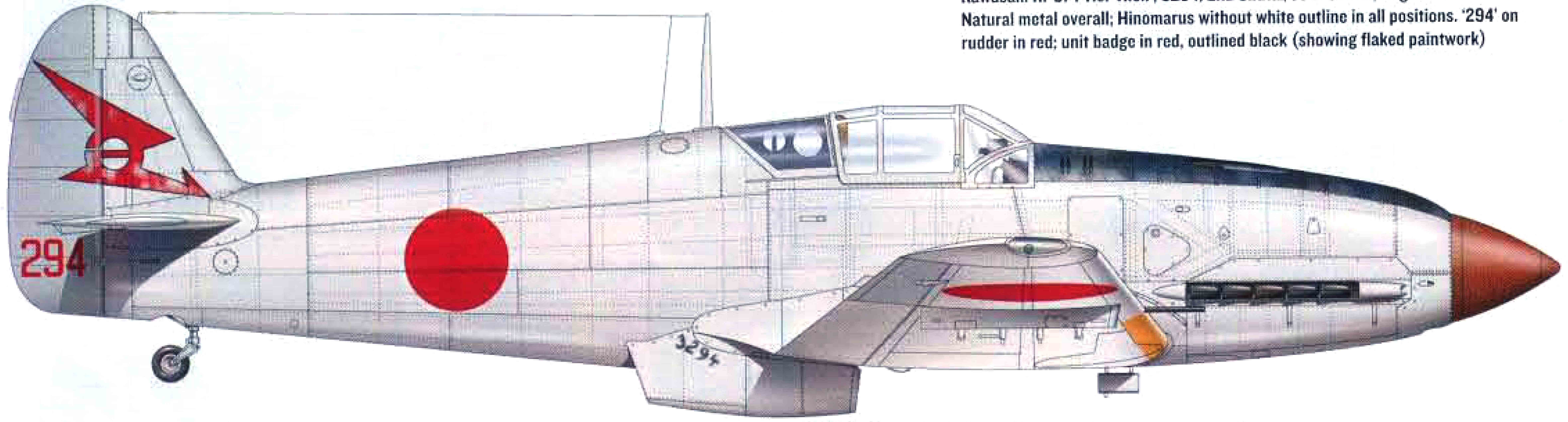
When aircraft were painted (e.g. upper surfaces in dark olive green) these areas were painted in the corresponding colour; wing leading edges were always painted in warm yellow.

Spinners were usually painted a reddish-brown

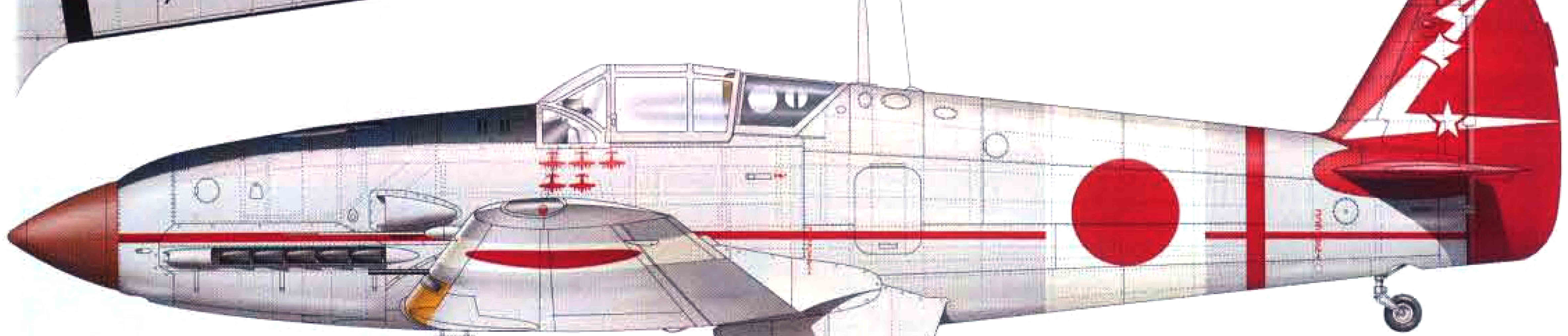


Left: Detail of 'do not walk' markings

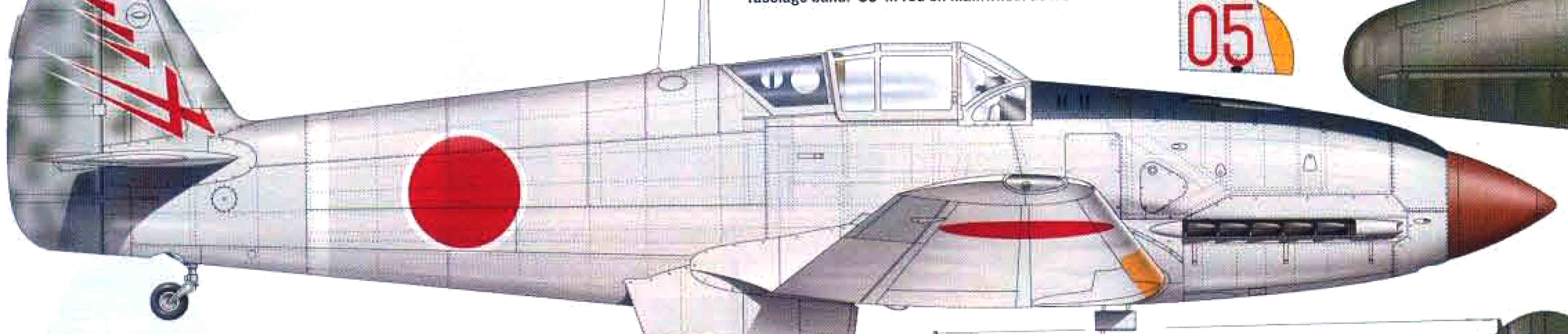
Kawasaki Ki-61-I-Hei 'Hien', 3294, 2nd Chutai/56th Sentai, August 1945. Natural metal overall; Hinomarus without white outline in all positions. '294' on rudder in red; unit badge in red, outlined black (showing flaked paintwork)



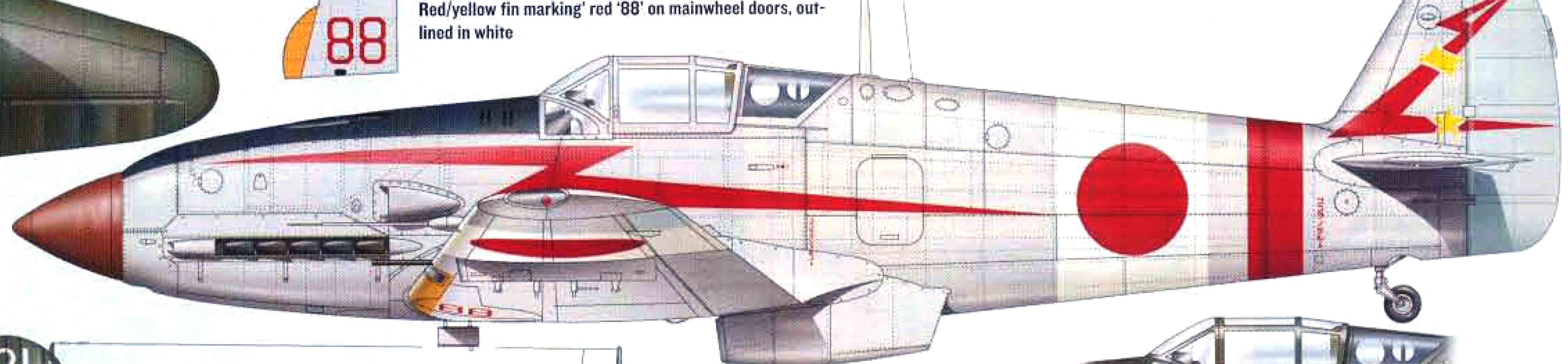
Kawasaki Ki-61-I-Hei, 244th Sentai, 1945. Natural metal overall with black anti-dazzle panel; reddish-brown spinner. Red tail unit with white unit marking; red band and flash on fuselage. National markings over white bands

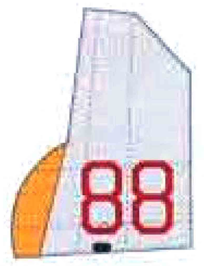


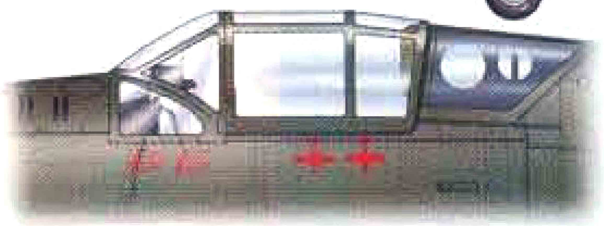
Kawasaki Ki-61-I-Otsu, 05, 37th Sentai, Katsuyama (Formosa), March 1944. Natural metal overall with some mottling in dark green on vertical tail surfaces; white rear fuselage band. '05' in red on mainwheel doors



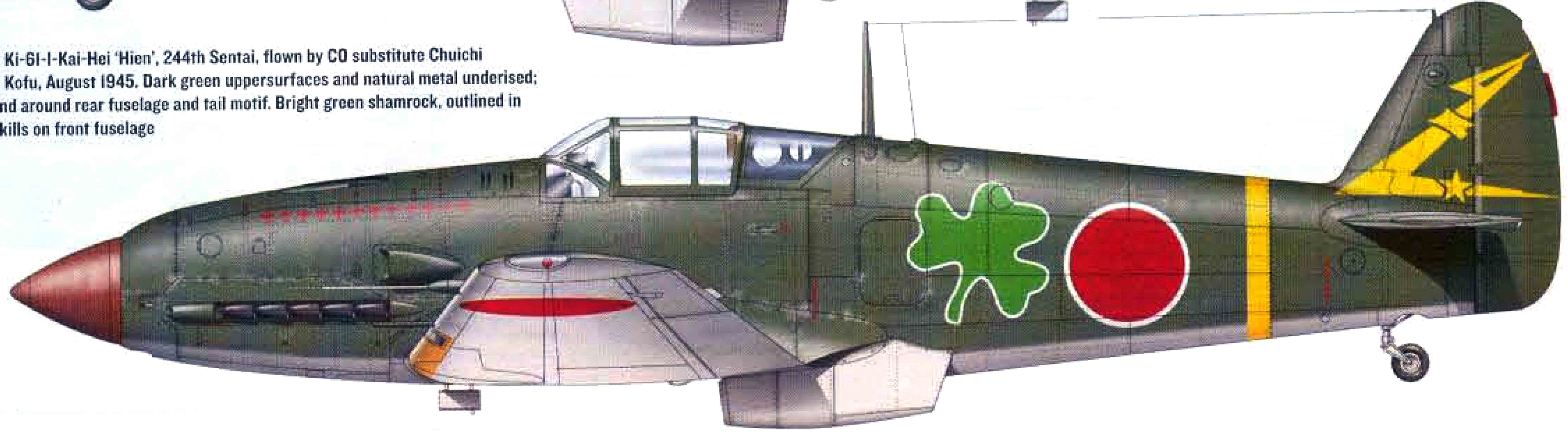
Kawasaki Ki-61-I-Hei, 88, flown by Major Kobayashi, CO of 244 Sentai. Natural metal overall; red flash and band on fuselage. Hinomaru over a 'home defence' white background. Red/yellow fin marking' red '88' on mainwheel doors, outlined in white



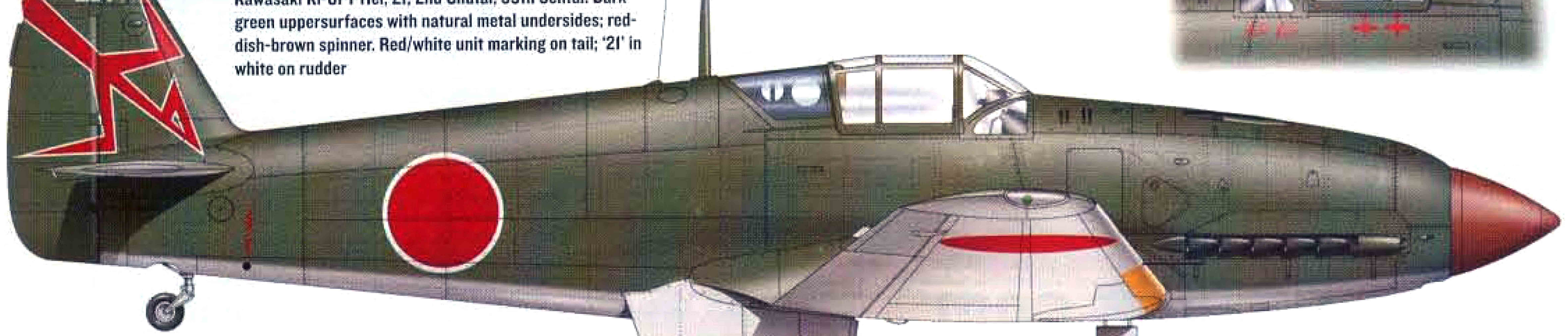




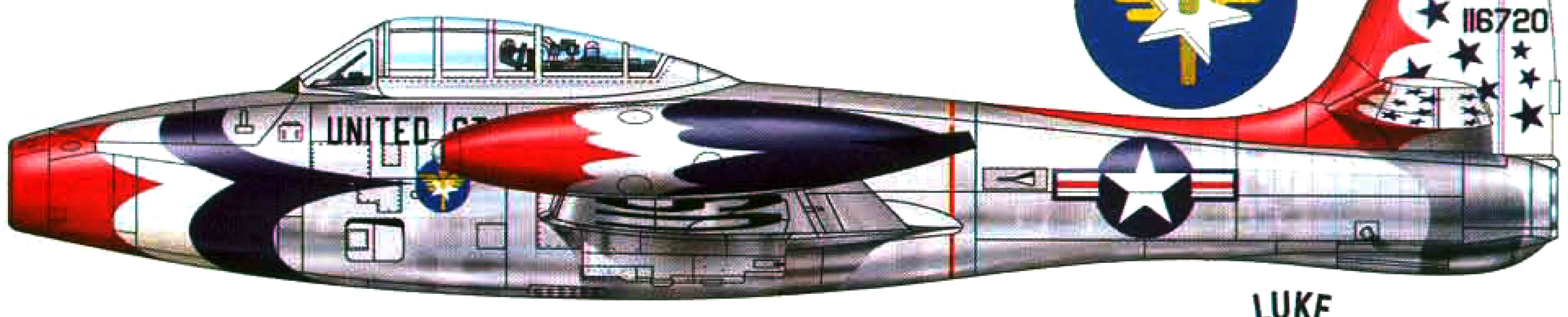
Kawasaki Ki-61-I-Kai-Hei 'Hien', 244th Sentai, flown by CO substitute Chuichi Ichikawa, Kofu, August 1945. Dark green uppersurfaces and natural metal undersides; yellow band around rear fuselage and tail motif. Bright green shamrock, outlined in white. 12 kills on front fuselage

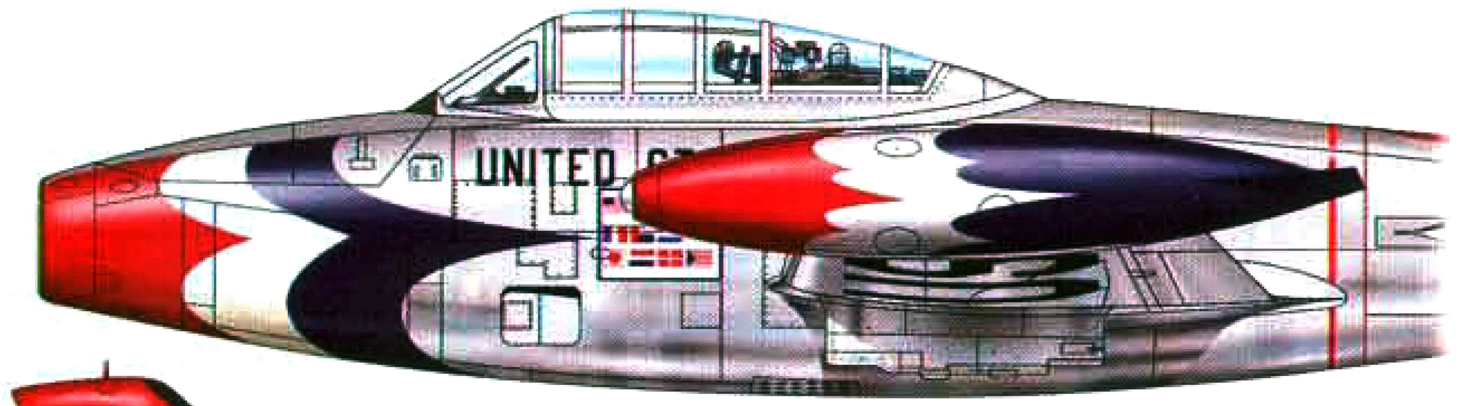


Kawasaki Ki-61-I-Hei, 21, 2nd Chutai, 39th Sentai. Dark green uppersurfaces with natural metal undersides; reddish-brown spinner. Red/white unit marking on tail; '21' in white on rudder

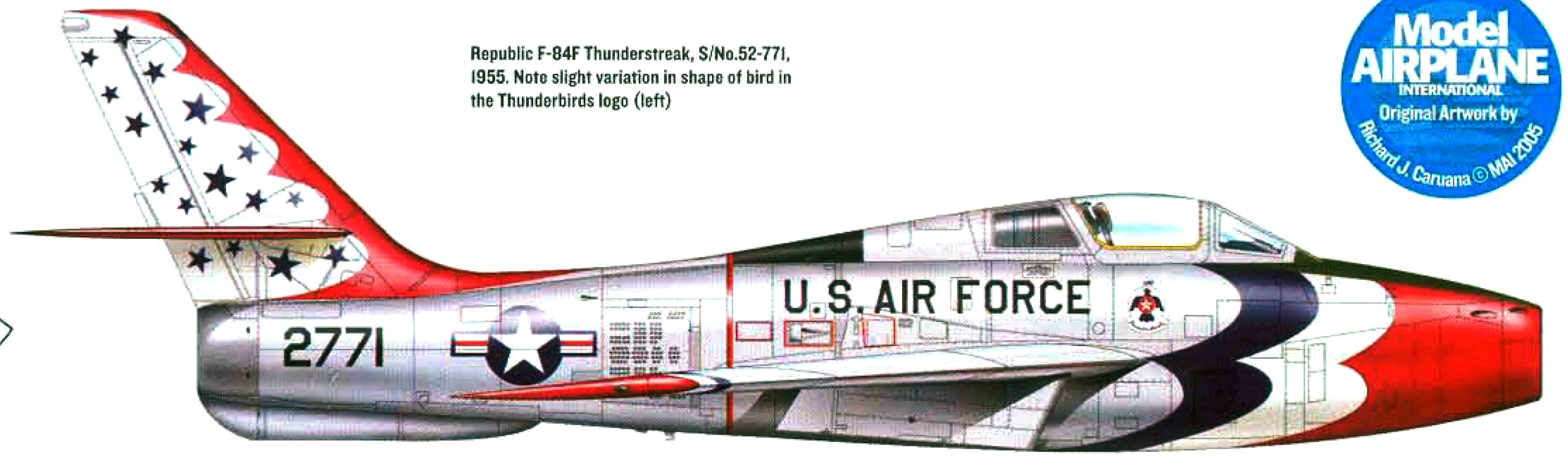


KIT BUILD
THUNDERBIRDS PROFILES





Republic F-84G-26-RE Thunderjet, S/No.51-16720, 1953. Note Air Training Command marking on fuselage; this was later replaced by small flags of countries visited on the port side, with the new 'Thunderbirds' logo applied to the starboard side as from 1954 (see scrap views below)



Republic F-84F Thunderstreak, S/No.52-771, 1955. Note slight variation in shape of bird in the Thunderbirds logo (left)

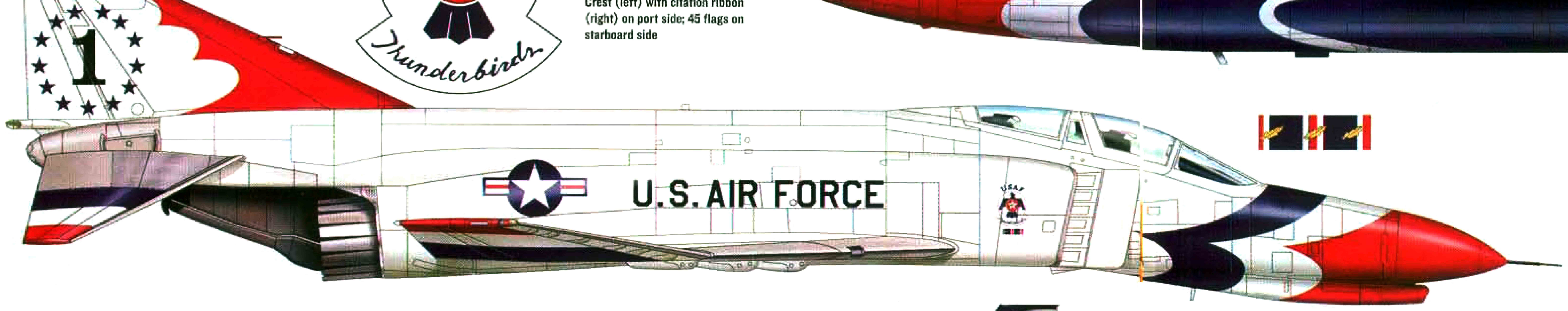
Citation ribbon below Thunderbirds logo

North American F-100C-10-NH Super Sabre, S/No.55-2728, flown by Maj Lucky Palmgren, leader Thunderbirds Team 1963. Twenty-seven flags on port side of nose (below), unit crest on starboard (left). See above for style of name as carried on canopy frame

North American F-100D-15-NA Super Sabre, S/No.55-2285, on loan from the 18th TFW, used for the Far East tour of 1959

Republic F-105B-15-RE Thunderchief, S/No.57-5814, flown by Maj. Paul Kauttu (leader), 1964

Below: McDonnell Douglas F-4E-MC Phantom, Leader's aircraft, 1972. Crest (left) with citation ribbon (right) on port side; 45 flags on starboard side



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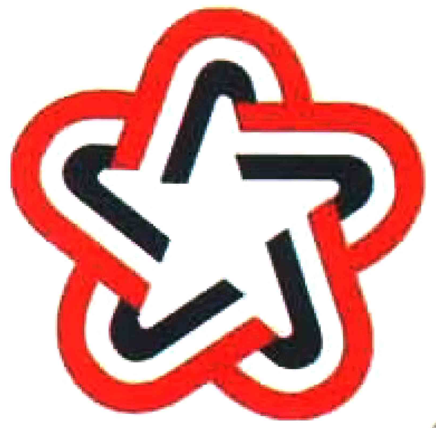
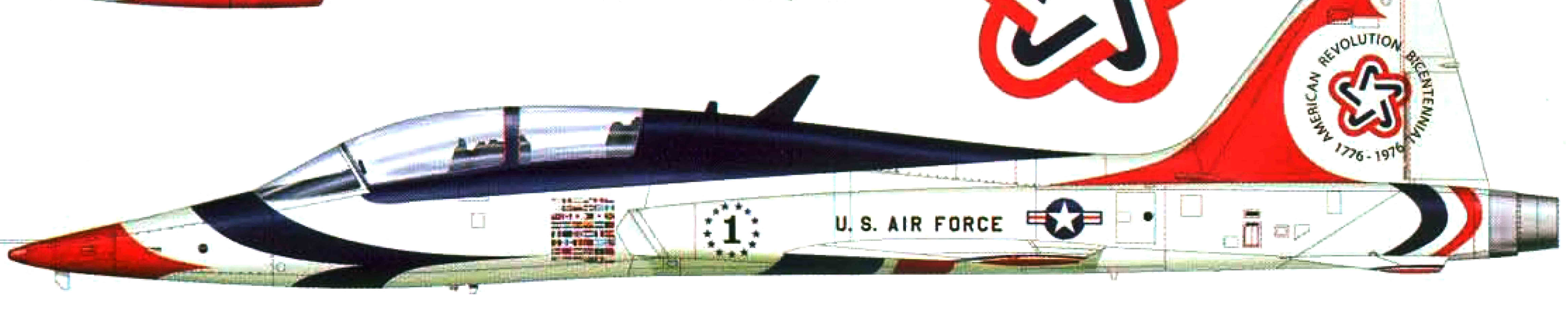
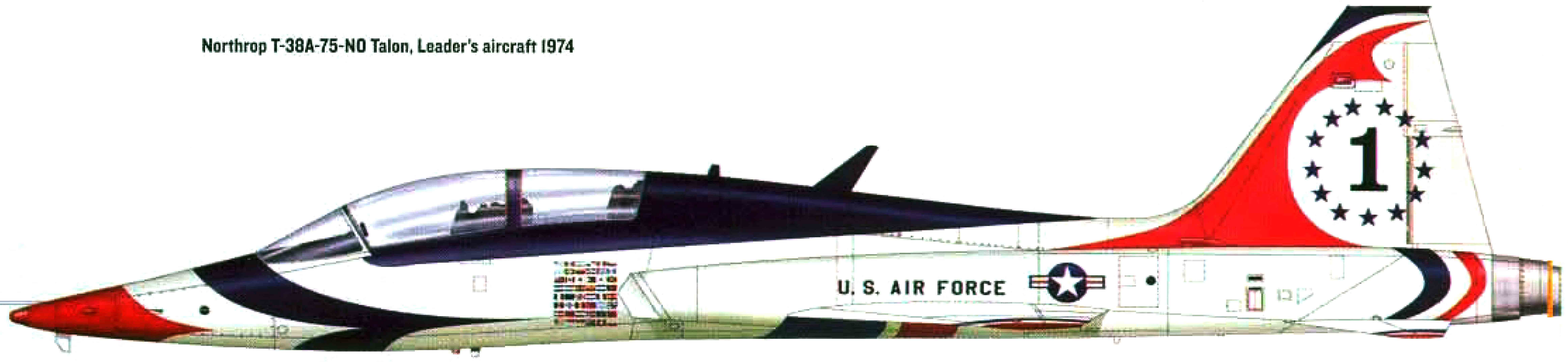


Northrop T-38A-75-NO Talon, Leader's aircraft in Bicentennial markings, 1976



Northrop T-38A-75-NO Talon, Leader's aircraft 1974



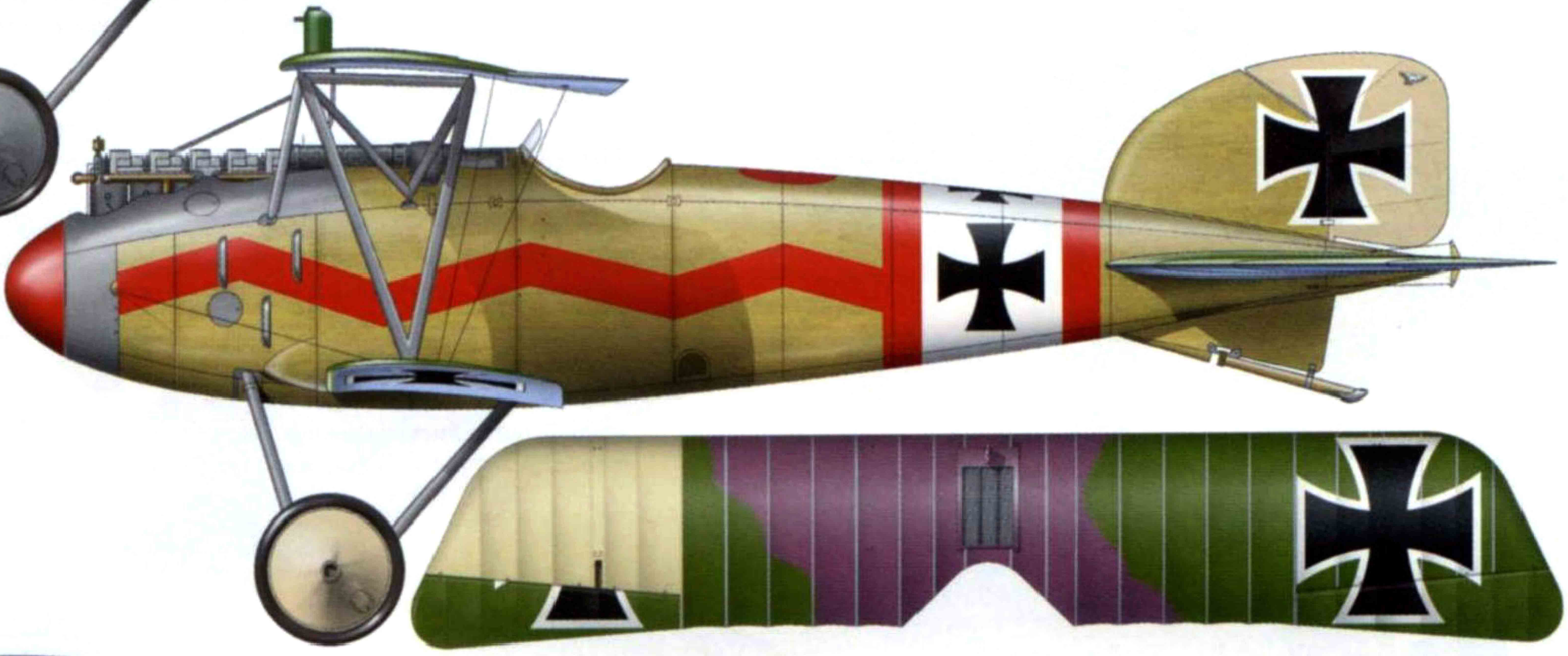
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2005

PHOTO ALBUM

Thunderbird F-16A, B & Cs - All photos © Glenn Sands

Model AIRPLANE International Original Artwork by Richard J. Caruana © MAI 2006

Albatros D.III, Jasta 5, March 1917. Varnished natural wood fuselage and grey metal areas, including interwing struts; dark green/mauve/light blue wings. Green tail section, including horizontal tail surfaces, outlined in red; blue/white fin/rudder 'Bavarian' flag pattern, blue/white/blue fuselage band. Red spinner



Albatros D.III, Jasta 11, Spring 1917. Natural plywood fuselage and fin with dark grey metal areas, including struts and mainwheel legs; clear doped linen rudder and wheel covers. Upper surfaces of wings and tailplane in dark green/mauve wavy finish; spinner and fuselage decoration in red. Note company logo on rudder

Albatros D.III, flown by Oblt Bruno Lörzer, Jasta 26, Belgium, June 1917. Black/white fuselage and vertical tail surfaces; black fin. Clear doped rudder and wheel covers; dark green/mauve upper wing surfaces with light blue undersides. Note patched port upper wing tip (see above)

Albatros D.III (Oef), 153/45, flown by Hauptmann Godwin Brumowski, Flik 41J, early 1918. Bright red overall with black/white crosses in six positions; black/white skull markings on fuselage side and dorsal position

Albatros D.III, 2nd Eskadra, Polish Air Force, Poznan, 1919. Dark green fuselage, dark green/mauve uppersurfaces with light blue undersides; red/white national markings in six positions and on rudder. Red/white stripe on fuselage, repeated in chevron form above top wing; red/white spinner

scale: 1:48

0 METRES 1 2

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(Side profiles only)

© Richard J. Caruana – 2006

QUICK TWITCHERS' GUIDE TO:

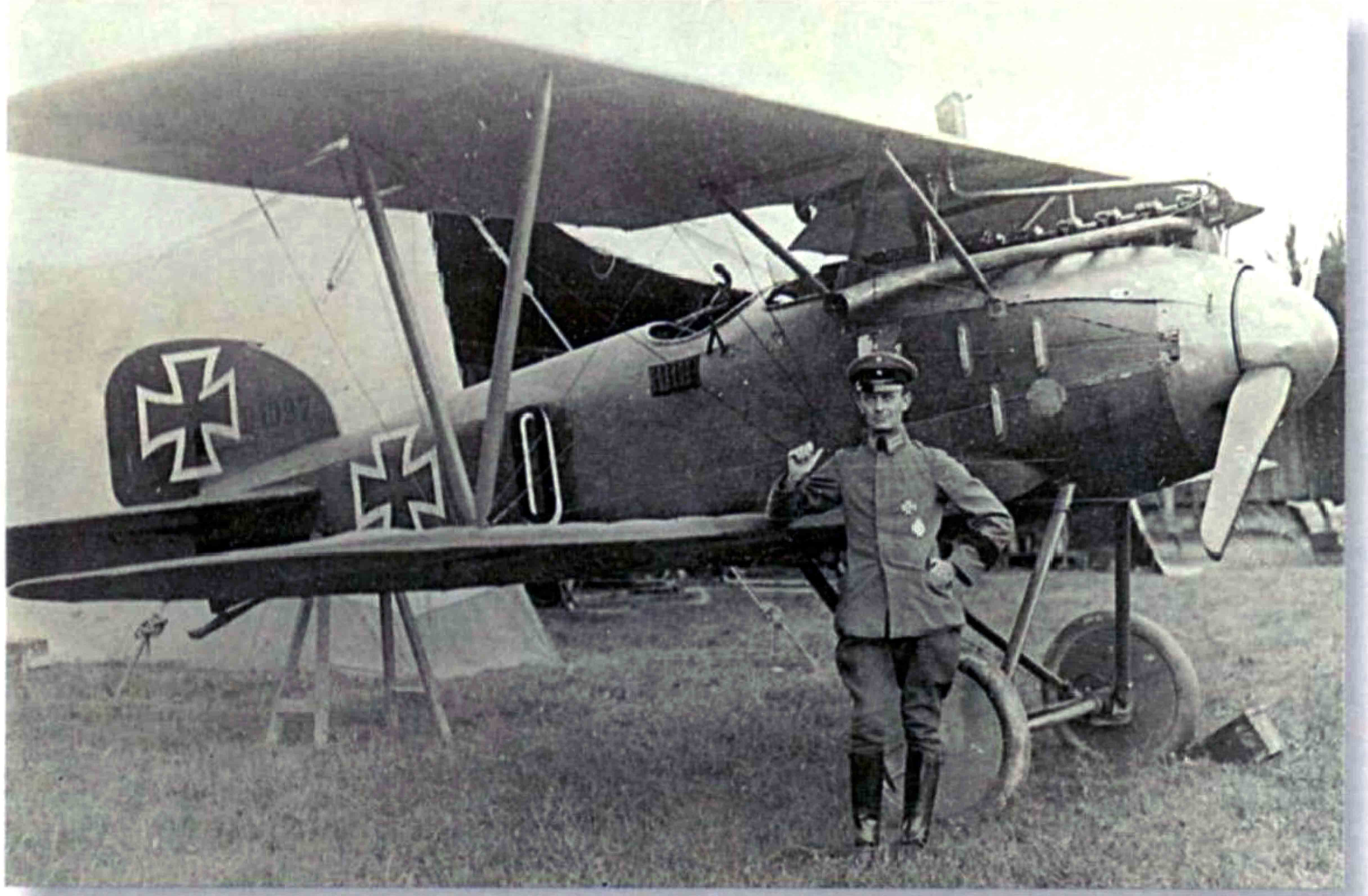
ALBATROS PLUMAGE

BY RAY RIMELL

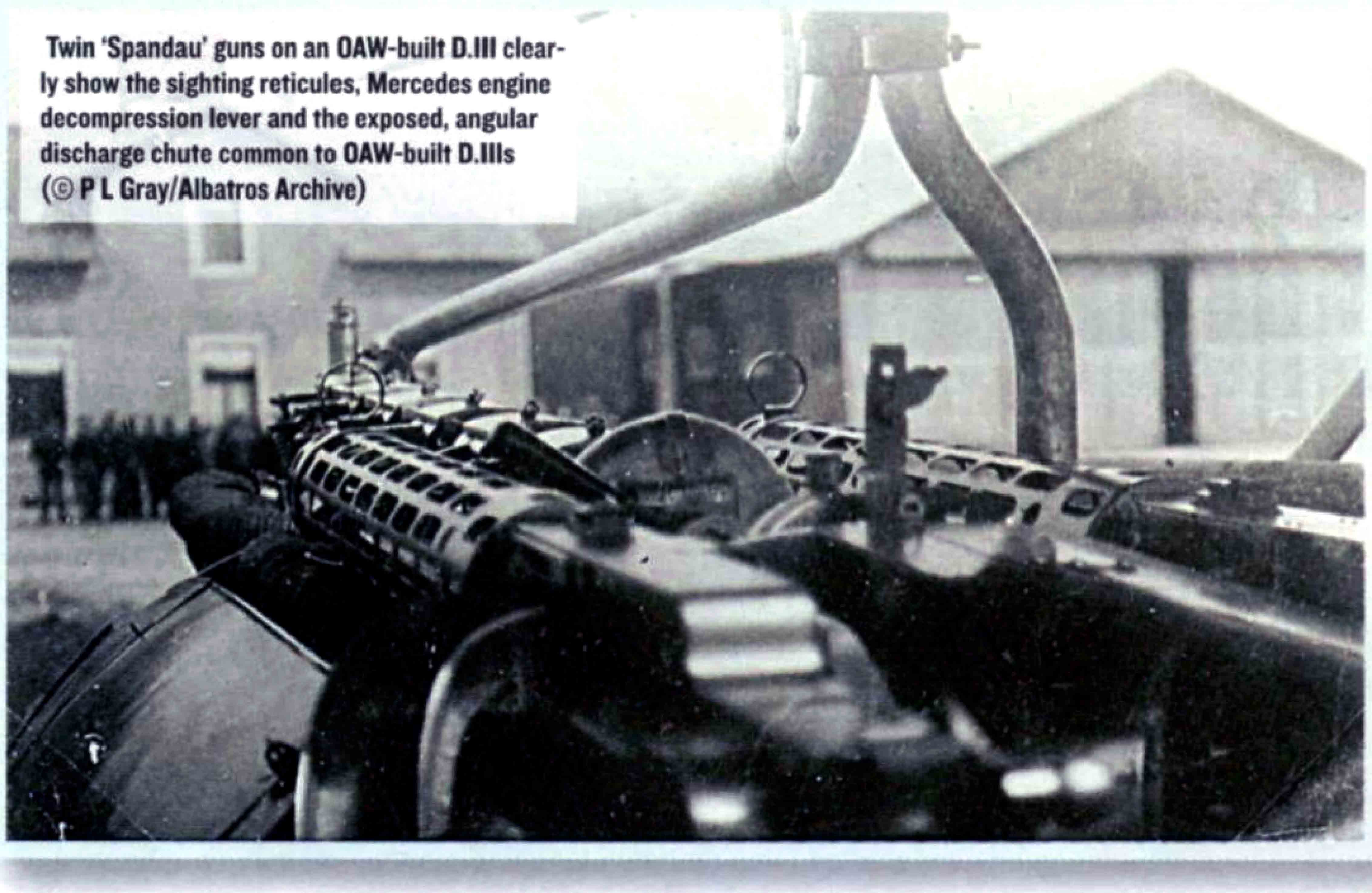
Recent research into WWI German aeroplane finishes has established that many examples of the D.III bore a three-colour camouflage scheme on their wing and tail upper surfaces. Although precise colour codes are not available, contemporary accounts are reasonably consistent. Wings were divided into three broad segments of pale green (port), red brown (centre) and a dark olive green to starboard. Undersurfaces were usually pale blue, with the varnished plywood fuselages appearing as a light or bright yellow to RFC pilots - at least according to most combat reports that have survived. Metal panels and wheel covers, struts too, were painted a dull shade, though wartime sources cite various options such as 'khaki brown', 'greyish beige', 'olive' or 'grey-green'. Modellers are really on their own with this one - save all this anxiety and paint your D.III red!

OAW-built D.IIIs were also seen in the three-tone scheme but the demarcations and colour sequence varied considerably. Note that on OAW-built D.IIIs the fuselage cross was positioned further forward than those of the parent concern's products, whilst underwing crosses were usually white-outlined on OAW fighters, plain black on Johannisthal machines.

Later Albatros bore mauve and olive green camouflage uppersurface patterns and in May 1917, five-colour 'lozenge' fabric was being employed by the Schneidemühl plant. Most OAW-built D.IIIs from the middle of the second production batch (D.2362 -2561/17) were covered in five-colour Tarnstoff over wing and tail surfaces. ■

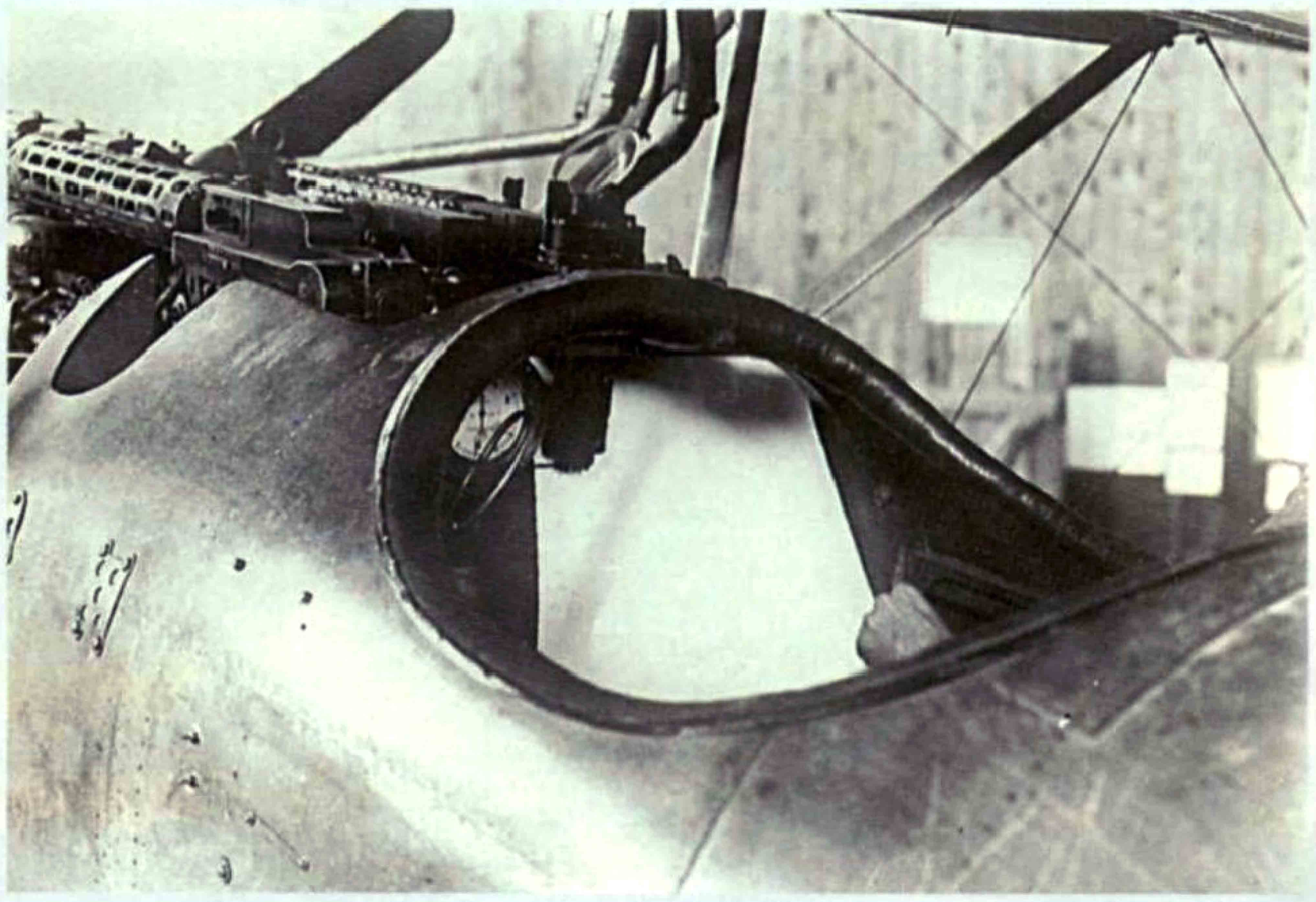


Possibly the last photo ever taken of Leutnant Reinhold Oertelt of Jasta 19 before his death on 7th July 1918 at the hands of Capt. Georges Guynemer for the French ace's 47th victory. Oertelt's Albatros D.III (1997/16) was from the first production batch of 400 D.IIIs built in late 1916 (1910-2309/16). The bracket below the cockpit holds a flare pistol under which is the container for six cartridges (© P L Gray/Albatros Archive)



Twin 'Spandau' guns on an OAW-built D.III clearly show the sighting reticules, Mercedes engine decompression lever and the exposed, angular discharge chute common to OAW-built D.IIIs (© P L Gray/Albatros Archive)

Albatros D.III D.1941/16 was flown by Leutnant Ernst Udet in Jasta 37. Also from the October Albatros batch it bears the same basic finish of varnished plywood areas, grey/green (?) metal panels, wheel covers and struts, with camouflaged upper wing and tail surfaces - pale blue below. The image should provide inspiration for diorama enthusiasts and there's plenty of scope. Tail trestles were *de rigeur* either for gun testing, maintenance (as here) or in preparation for flight. It was Jasta doctrine to raise the tail in this way so as to provide proper water and oil circulation when running the engine, until the water temperature reached prescribed take-off level for safety (© P L Gray/Albatros Archive)



FURTHER READING:

- Albatros D.III (Special) by Peter M Grosz (Albatros Productions, Ltd, 2003).
- Above The Lines by N. L. R. Franks, F. W. Baily and R. Guest (Grub Street, 1993)
- Albatros Aces of WWI by N. Franks & G. Van Wyngarden (Osprey, 2000)

Variation on a theme; the discharge chutes are removed from this captured D.III. The untypical optical sight, probably of British origin, may be noted (© P L Gray/Albatros Archive)

MiG-19S, '464', East German Air Force. Natural metal overall with national markings in four wing positions and both sides of fin; code in black

scale: 1:72

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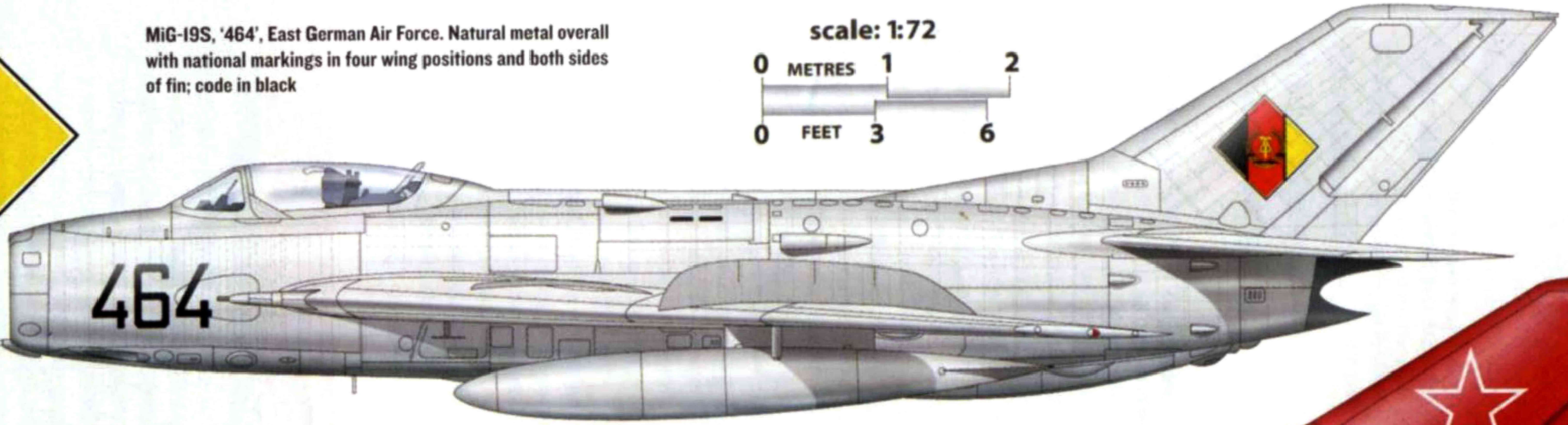
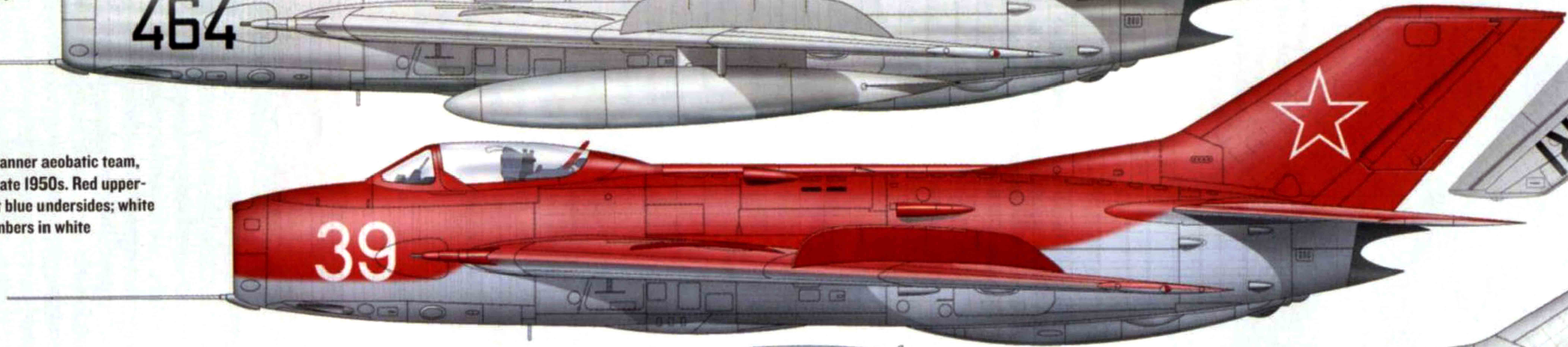
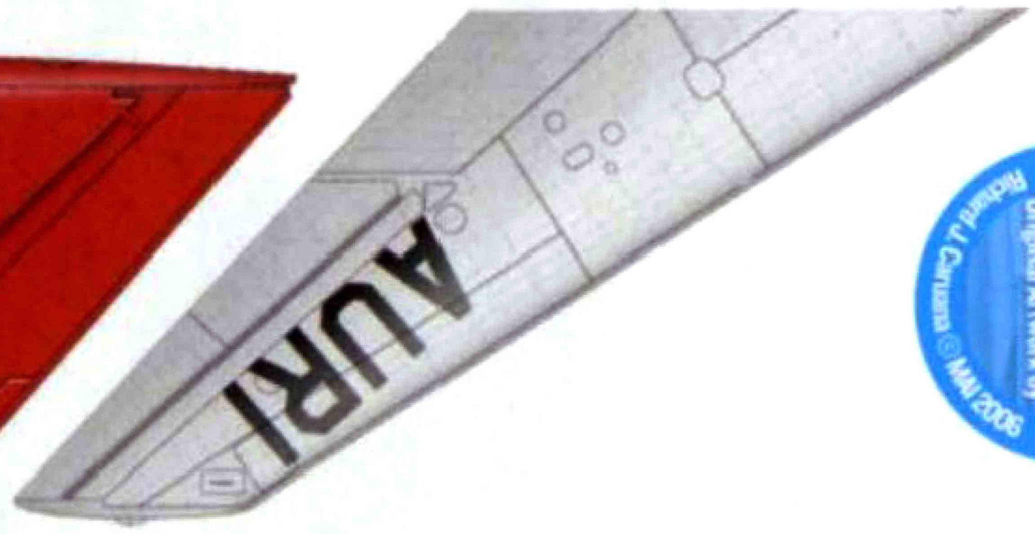
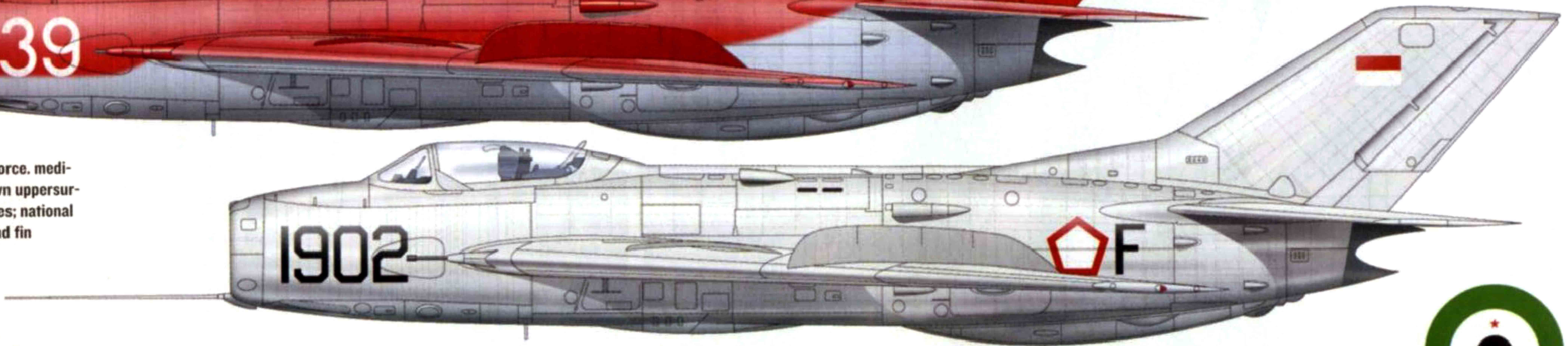


Below: MiG-19S, 1902/F, Indonesian Air Force. Natural metal overall with national markings on fuselage sides, above both wings and below starboard wing; 'AURI' in black under port wing. Code and serial in black



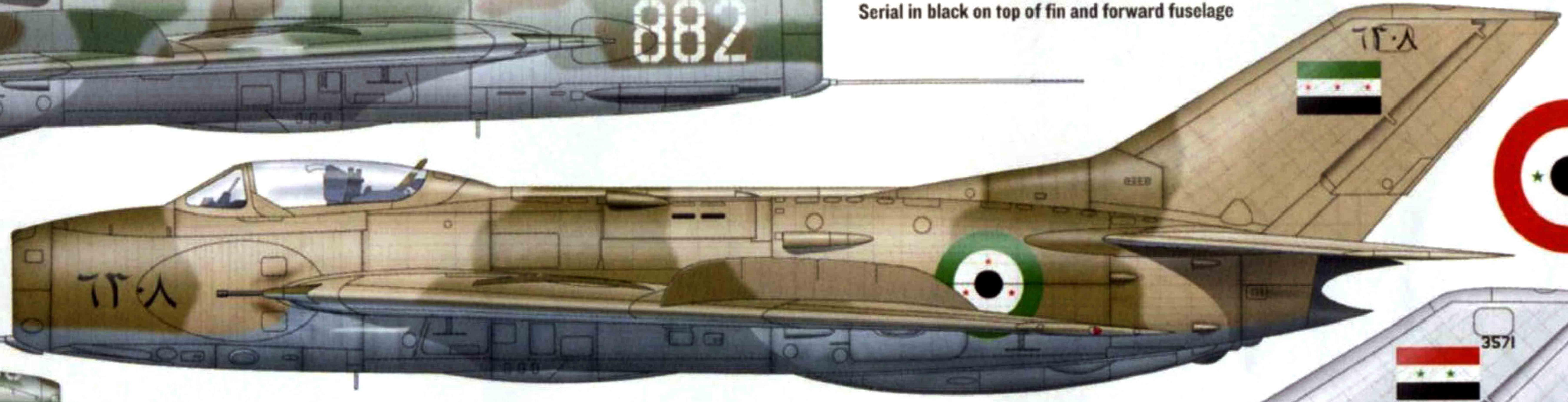
MiG-19, 47, Red Banner aeobatic team, Soviet Air Force, late 1950s. Red uppersufaces with light blue undersides; white outlined stars. Nmbers in white



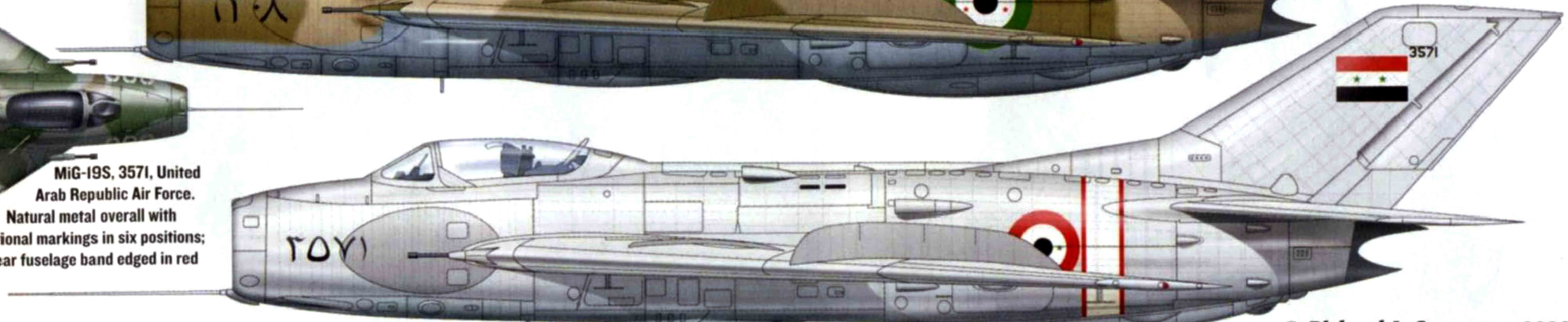


MiG-19S, 882, Bulgarian Air Force. medium grey/dark green/dark brown uppersurfaces with light blue undersides; national markings on fuselage sides and fin

MiG-19S, 3608, Egyptian Air Force, 1967. Dark earth and sand uppersurfaces with light blue undersides; national markings in six positions. Serial in black on top of fin and forward fuselage



MiG-19S, 3571, United Arab Republic Air Force. Natural metal overall with national markings in six positions; white rear fuselage band edged in red



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The Malta Connection

HMS ILLUSTRIOUS

BY RICHARD J. CARUANA

Flagship of the Royal Navy, HMS Illustrious, spent a few days at Malta during November 2005, rekindling memories and connections with the inhabitants of the Island. Under the command of Captain Robert Cooling RN, the ship berthed alongside Pinto Wharf on 21 November, to a grand welcome by thousands of Maltese and tourists who lined the bastions of Valletta on one side of Grand Harbour and The Three Cities (Vittoriosa, Senglea, Cospicua) on the other side.

On the way into harbour, the ship fired a 21-gun salute, this being reciprocated from the Upper Barrakka's saluting gallery fired by members of the Armed Forces of Malta. "There must have been 10,000 people welcoming the ship to harbour", said Captain Cooling during his first press conference, visibly moved by what he described as an 'incredible welcome'. Commander Ian Annet added that he could not remember such a reception in a foreign port during his 20 years of naval career. This time Illustrious came to Malta in support of HM Queen Elizabeth II's visit, that was to commence a few days later, and was accompanied by HMS Exeter.

1941

During the first six months of operations against Malta the Regia Aeronautica (Italian Royal Air Force) registered very meagre results and the defences of the Island had been gradually improved with the arrival of more fighter aircraft. These, however, were still well below the desired level and the proof of this was to come during the early months of 1941. During December 1940, Fliegerkorps X began arriving in Sicily in full force, with the intent of commencing a major offensive the following month.

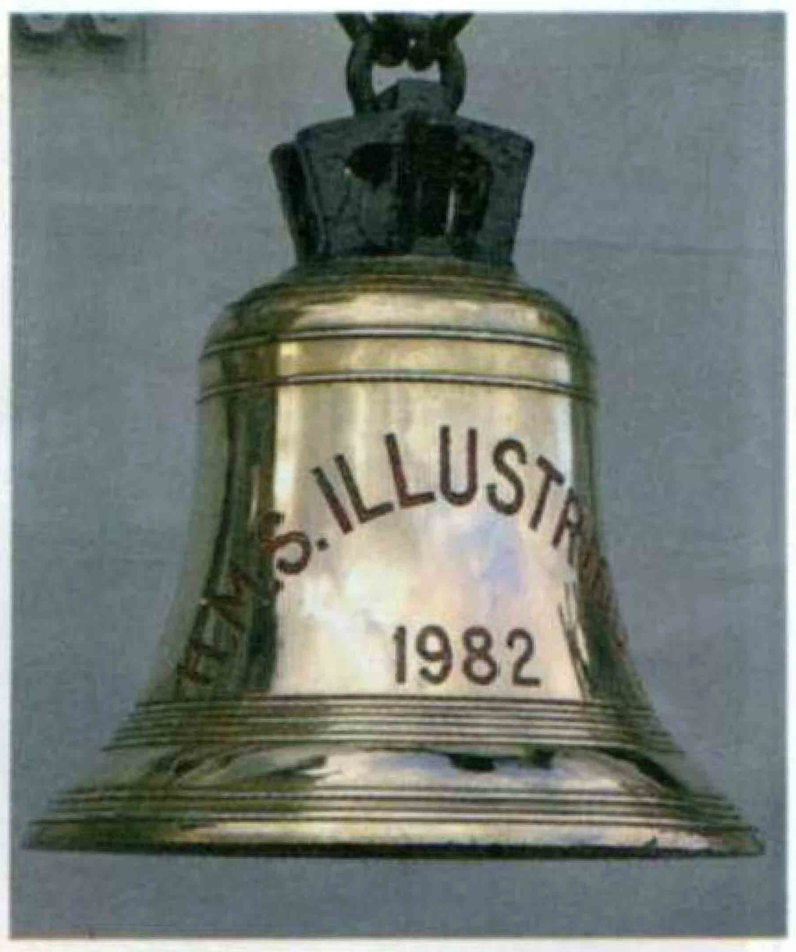
These consisted of two Ju 88 units based at Catania (Stab. II and III/LG I), one unit of He IIIs at Comiso (II/KG 26, 2/KG 4), two Ju 87 units based at Trapani-Milo (Stab. StG 3/ I/StG I and II/StG 2), a unit of Bf 110C-4s (III/ZG 26) based at Palermo together with photo reconnaissance, transport and air-sea rescue units. Fliegerkorps X consisted of some 10,000 men and established its Headquarters in Taormina.

On January 6, 1941 'Force H' (Operation Excess) left Gibraltar for Malta and Greece with a convoy of four supply ships together with their escorts. These included the aircraft carrier HMS Illustrious and a formidable escort of warships. The very next day the naval units were first attacked by S.79s of 32° Stormo from Sardinia when off Bougie, Algeria. On January 10, Illustrious became the target of a very heavy attack by Ju 87s from I/StG I led by Major Enneccerus and II/StG 2 under the command of Kapitän Werner Hozzel, which had just arrived at Trapani, Sicily, that same day. This attack became a fierce battle during which the German dive bombers managed to hit the carrier six times. HMS Warspite was badly damaged by one of their 500kg bombs dropped from a height of not more than 500m. Fulmars that had been sent up to defend the carrier were ordered to make for Hal Far, Malta, which at that time was only some 100 miles away.

A second attack was performed on the same day during which the He IIIs of II/KG26 were also involved. As soon as the Ju 87s landed in Sicily they were quickly re-armed and refuelled and continued to hound the carrier until she entered Malta's Grand Harbour, at about 1800hrs, with 126 dead members of the crew and 91 injured. In the meantime the Fulmars tried to return to their ship but could not land due to a large gaping hole in the flight deck. Moreover the Illustrious was listing to port and was down at the stern.

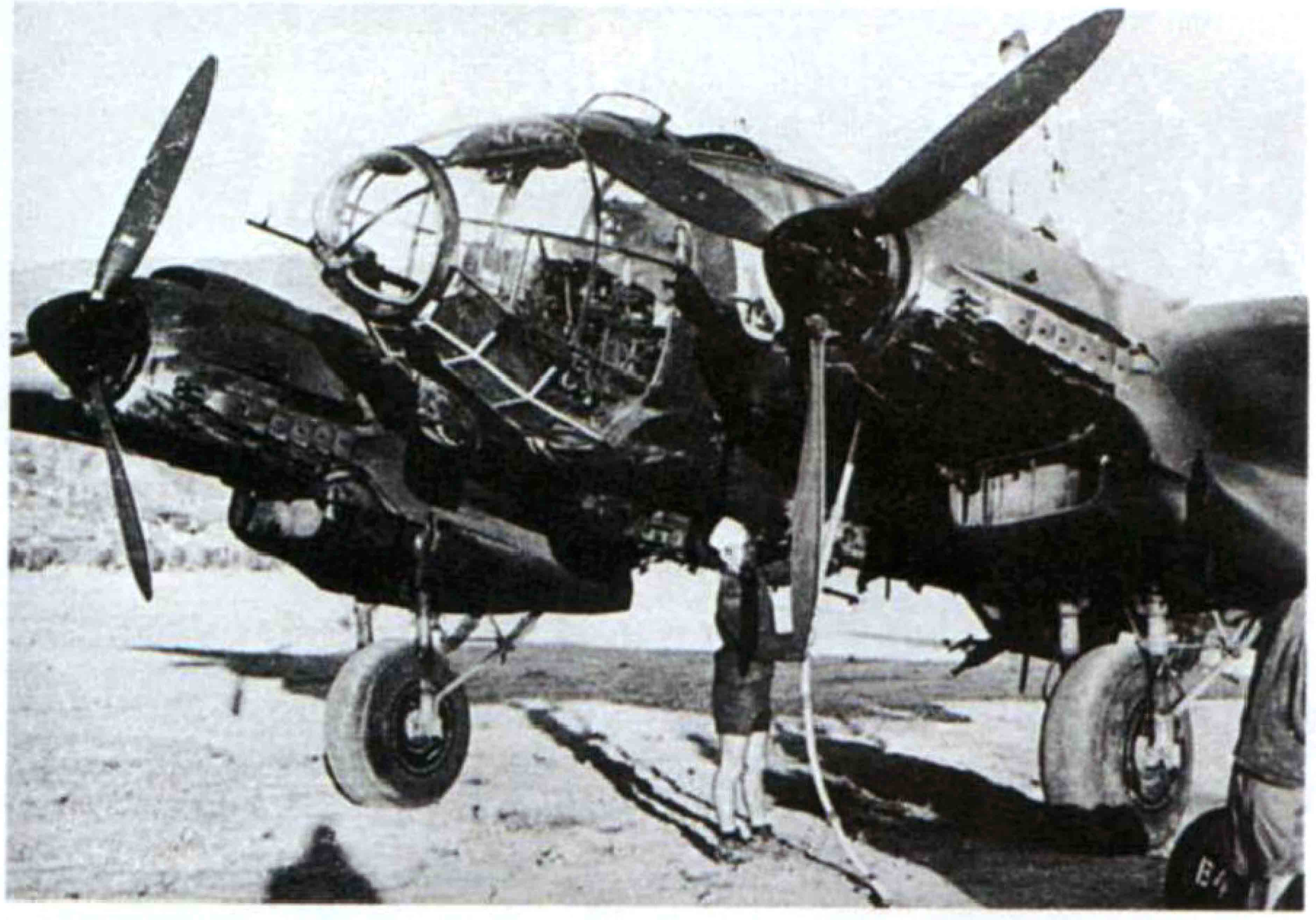
Since the convoy passed to the south of Malta and went on its way to Greece (only one supply ship of the four was intended for Malta), the Luftwaffe concentrated its efforts over the next few days in chasing it, before it steamed out of range. While the carrier was in the relative safety of Malta's harbour and its formidable AA, Ju 87s from II/StG2 guided by a He III as navigator aircraft, chased the British fleet as it steamed eastwards. At their extreme range of some 300 miles from Sicily, they attacked and managed to sink the cruiser Southampton, which received a direct hit

Merlin HM Mk I, ZH863/B-270, on the deck of HMS Illustrious. This was the only example on board at the time of the ship's visit to Malta

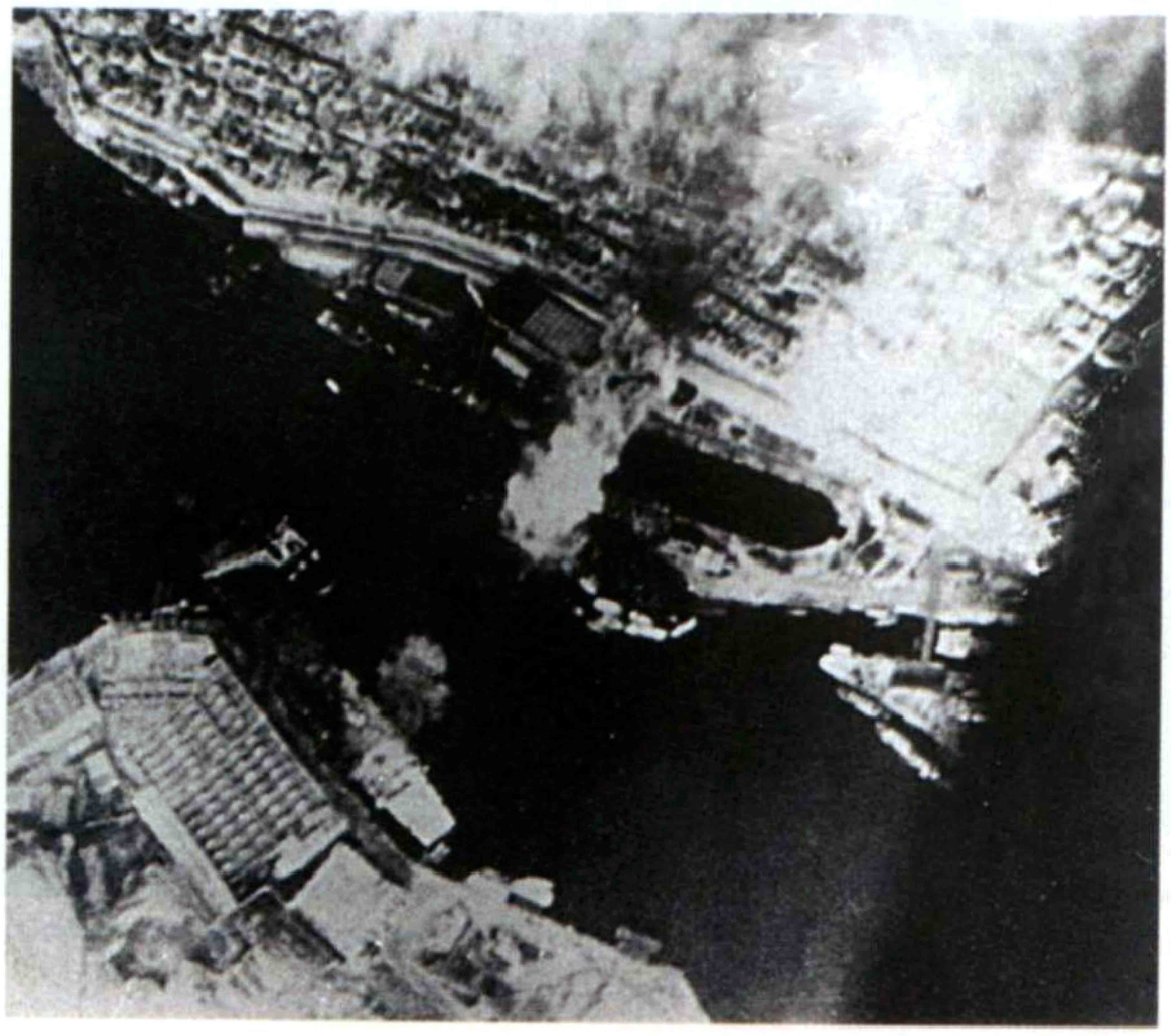


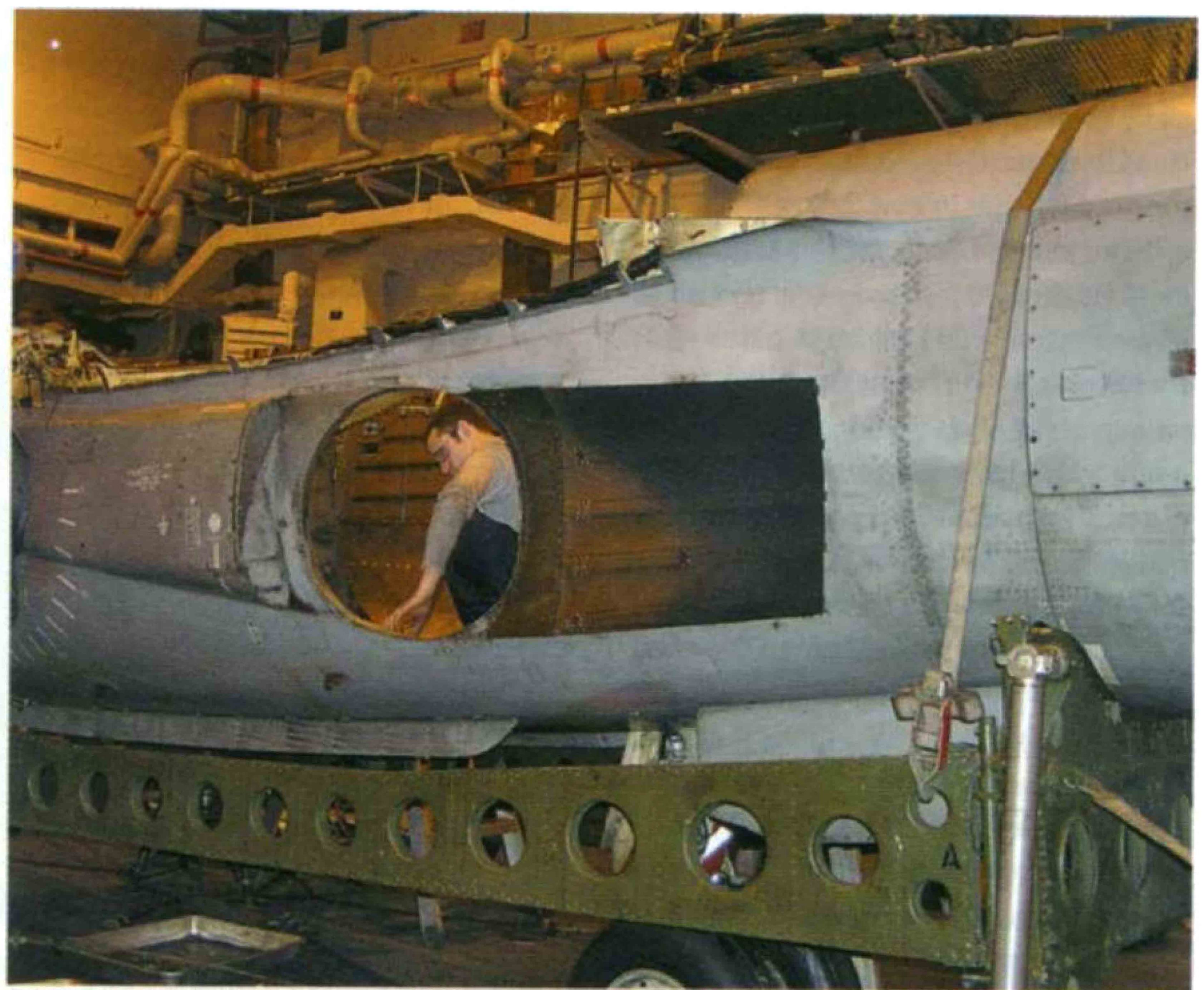
Close-up of XZ440's fin shows clear signs of previous service with No.800 and 899 Naval Air Squadron (see profile for further details)

HMS Illustrious berthed at Pinto Wharf, below the bastion of Malta's capital city, Valletta

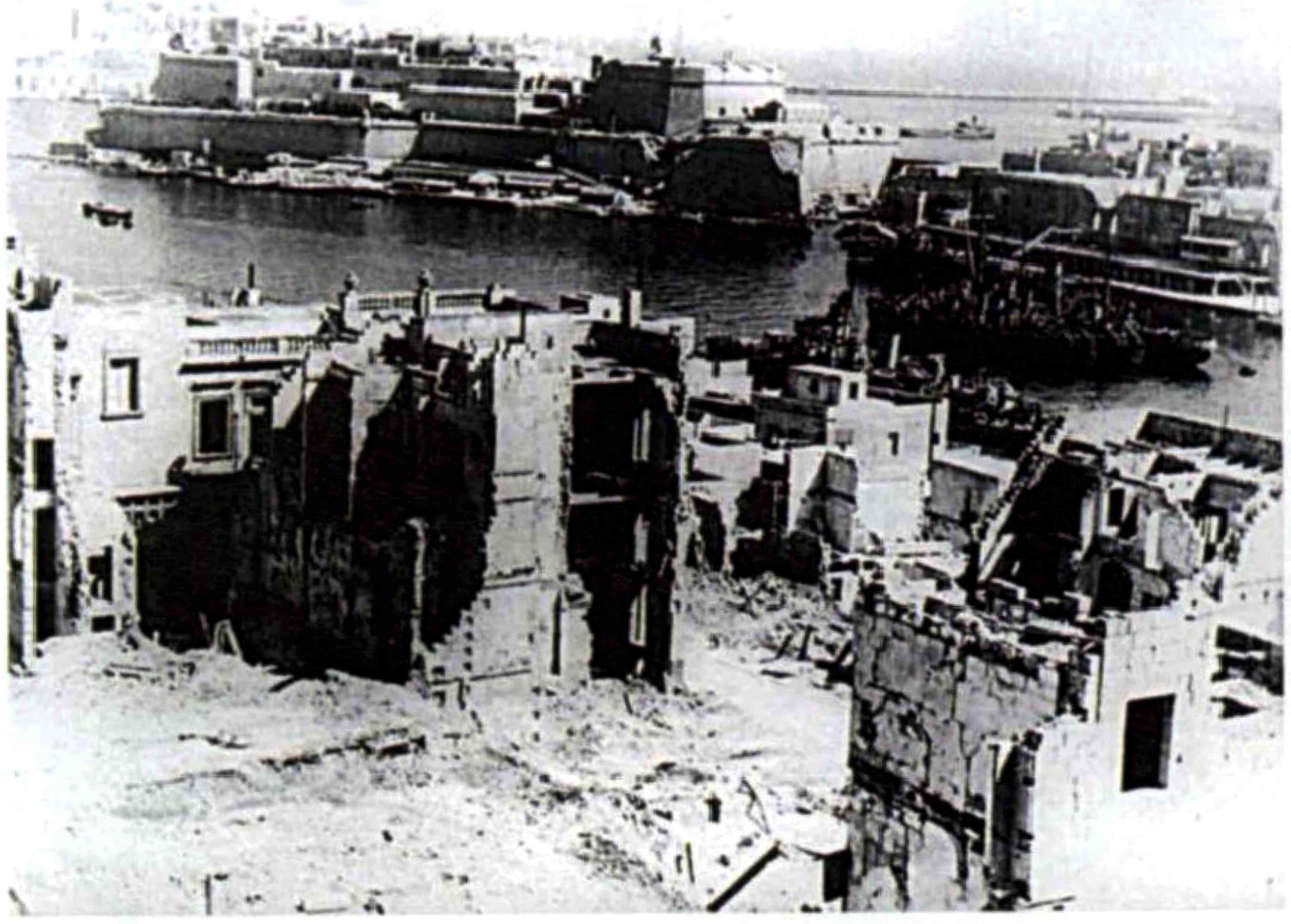


Another view of ZH804 in its stripped down form inside the hangar of HMS Illustrious





Sea Harrier ZH804/007 undergoing extensive maintenance inside the hangar of HMS Illustrious on 24 November 2005



Pride of place on HMS Illustrious' bow ramp was Sea Harrier FA.2 XZ440/L-002. Two other Sea Harriers and a Merlin helicopter can be seen in the background

"The Luftwaffe offensive against the island, especially centred on Grand Harbour and the Illustrious, started on January 16. These attacks continued practically without respite until the Illustrious managed to steal out of the harbour and make for Alexandria on January 23"

in the engine room.

Malta was preparing to brace itself for the first Blitz in its history. The Luftwaffe offensive against the Island, especially centred on Grand Harbour and the Illustrious, started on January 16. During the six days that followed, II/KG26 was ordered to leave Sicily for Benghazi with its 14 He 111s under the command of Major Bertram von Comiso to patrol and try to control the channel between that town and the Suez Canal, a tall order for a unit which lost seven machines in the process without making contact with any British convoys. This lull in the fighting for Malta's defenders served to organise a proper defence while Maltese dockyard workers worked around the clock to repair the ship.

At around two in the afternoon of January 16 all hell was let loose. A considerable force, consisting of 20 Ju 88s, 20 Bf 110s and 45 Ju 87s performed their first attack, and systematically dropped tons of bombs onto the carrier and the surrounding area. Notwithstanding the formidable barrage and a defensive fighter element consisting of some Hurricanes, one Gladiator and the carrier's Fulmars, the Germans lost only four of their number, with others damaged.

These attacks continued practically without respite until the Illustrious managed to steal out of harbour and make for Alexandria on January 23. Luftwaffe losses at the hands of defending fighters and AA guns around Grand Harbour were very heavy; 2 Staffel of I/StGI, for example, lost all its pilots except its commanding officer.

The brunt of the attack was borne by Senglea, Vittoriosa and Cospicua, including the dockyard and, to a lesser degree, Valletta. Many people lost their homes and belongings. Several were killed and hundreds were trapped beneath the rubble of their buildings. Amongst the priceless treasures lost during this blitz was the Basilica of Our Lady of Victories in Senglea which was completely destroyed

Sea King XV174/88 in a well-worn standard finish of Medium Sea Grey overall. This scheme formed a sharp contrast to the pristine finish of ZE418

Sea Harrier FA.2 ZE690/003. The standard 'L' code on the fin of this aircraft seems to have peeled off, with only the top part visible (see colour profile for further details)

Sea Harrier FA.2, ZH813/L-001, heavily chained to the deck of HMS Illustrious... nice idea for a diorama!

on January 19, where the belfry clock still marked ten minutes to two of three days earlier when the church was first bombed.

2005

Today's HMS Illustrious is a magnificent ship, the fifth to bear the name, weighing 25,000 tons with an overall length of 208 metres. It is 16 decks tall and carries a crew of 1,050. It had just completed an intense training and assessment period, leading the Trafalgar 200 and International Festival of the Sea Celebrations.

Preparations for the November 2005 visit had been ongoing for months, during which no detail was spared. These included a series of lectures by military historian Andrew Gordon on the part played by Malta and the Maltese during the terrible ordeal of 1941. Following the arrival of HMS Illustrious in Malta, I was able to visit the ship on two consecutive days.

During the first visit on 23 November, the ship was only open to small groups by invitation; the visit on the following day was also by invitation, whereby Captain Cooling hosted a lunchtime reception in the presence of HM The Queen and HRH The Duke of Edinburgh. The first occasion served to 'meet' the aircraft on board the ship in close-up. These included six Sea Harriers FA.2, two Sea Kings ASaC and a Merlin HM Mk I. Of the six Sea Harriers, 007/ZH804 was in a dismantled state in the front end of the hangar, undergoing extensive maintenance. Most interesting was the other Sea Harrier residing inside the hangar, 004/ZH803, in pristine condition and fully armed, and bearing the name of Maj. B.H. Ritterby USMC as its pilot beneath the windscreen.

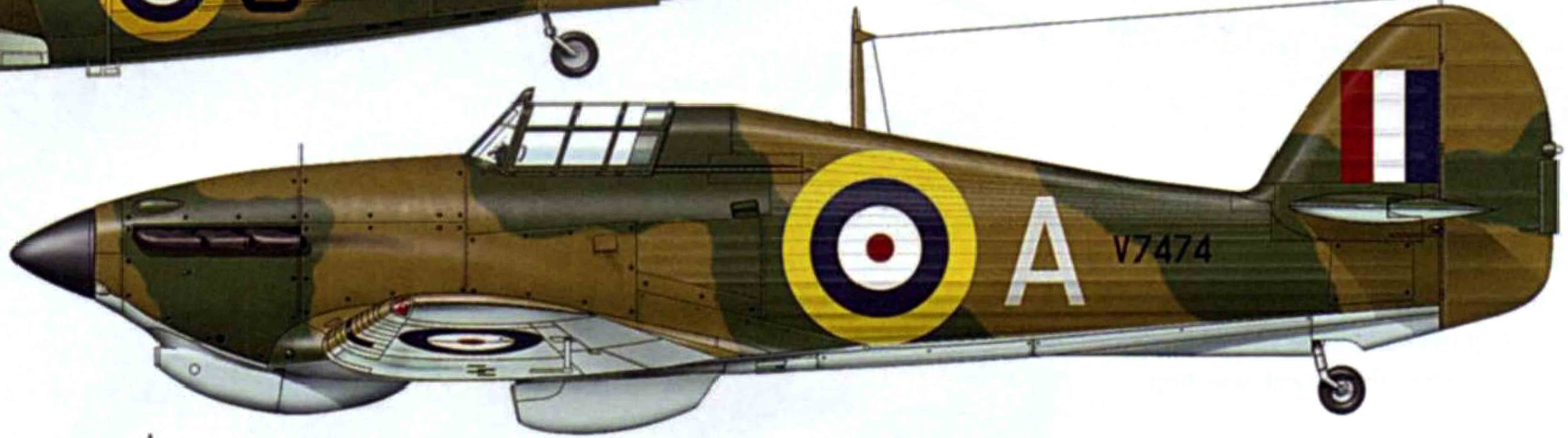
Most unusual was the high-gloss finishon this Sea King ASaC, ZE418/B-186, complete with high visibility roundels in bright blue/white/red colours

The Sea Harrier harks back to the first generation of this famous jump jet, based on the Royal Air Force's GR.3 which it resembles in most aspects, especially in its original FRS.I version. Even so, it is a formidable weapon, especially in its updated FA.2 version, optimised for air-to-air combat and fleet air defence. In this form, the Sea Harrier has been given an extension of the rear fuselage for the installation of additional avionics. The most distinguishing feature is the enlarged bulbous nose that houses the Ferranti 'Blue Vixen' radar and the repositioning of the nose pitot on the leading edge of the fin.

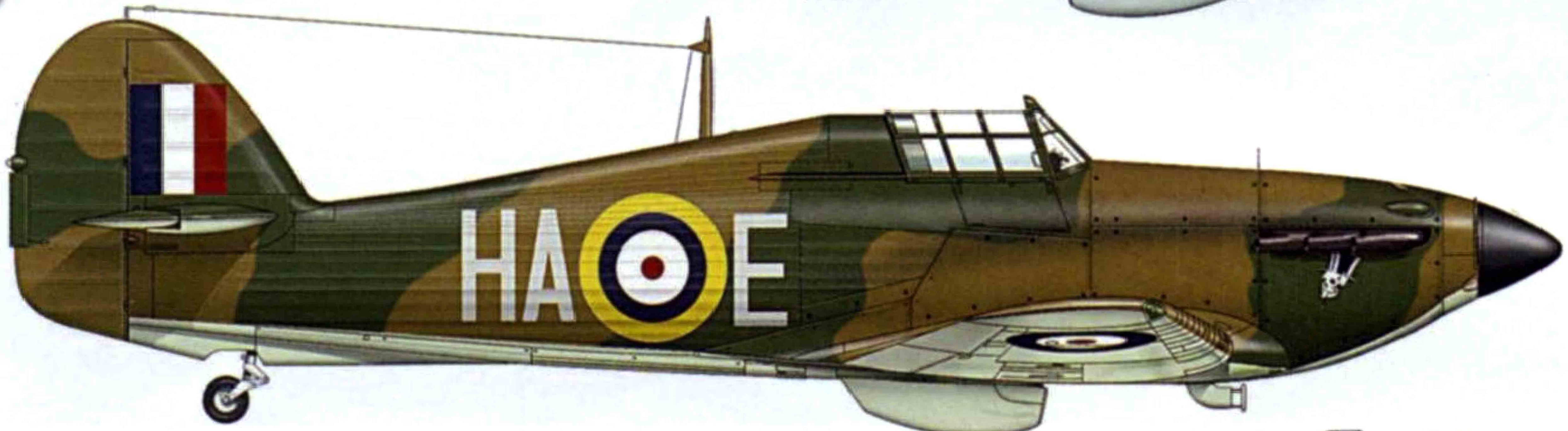
On board the ship there was a single Merlin HM Mk I, a type that has been in service with the RN since 1998. Primary mission of the Merlin is the anti-submarine role, although it is also equipped for anti-surface warfare. The other two helicopters present were Sea Kings, which are now referred to as Airborne Surveillance and Area Control (ASaC). Among the differences from the AEW version, one can notice the removal of the dorsal hump.

HM The Queen arrived on HMS Illustrious at around 12.30pm on November 24, 2005. Guests had been filing up the gangway into the ship's hangar since 11.00am, under a constant drizzle. It was indeed a memorable occasion, especially for the hard-working committee of the Battle for Malta Veterans' Reunion of which I formed part. At first we thought it was rather strange that we had been cut off from all the other guests. We were the first group to be introduced to HM by Sir Vincent Feann, British High Commissioner to Malta. We were later highly gratified to learn that HM had insisted on meeting us, and to talk to us individually. ■

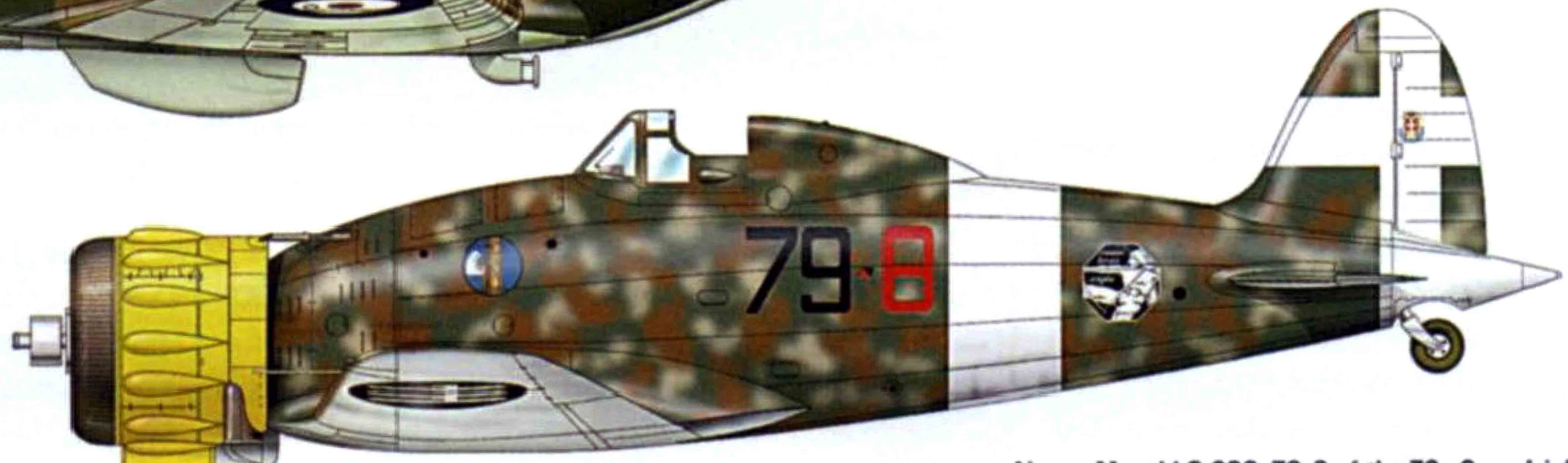
Gloster Sea Gladiator N5520/S, No.261 Squadron, Hal Far (Malta), January 1941. Dark Earth/Dark Green/Sky finish with standard markings, except for the Fleet Air Arm style fin flash that had been retained; Code 'S' and serial in black



Hawker Hurricane Mk I, V7474/A, No.261 Squadron, Luqa, early 1941. This aircraft was flown to Malta from HMS Argus by Flt Lt J.A.F. MacLachlan on 17 November 1940. MacLachlan (DFC+) was to become one of Malta's major aces, with eight victories. Dark Earth/Dark Green upper surfaces; undersides most probably in Duck Egg Blue. Black spinner and Light Grey code 'A'

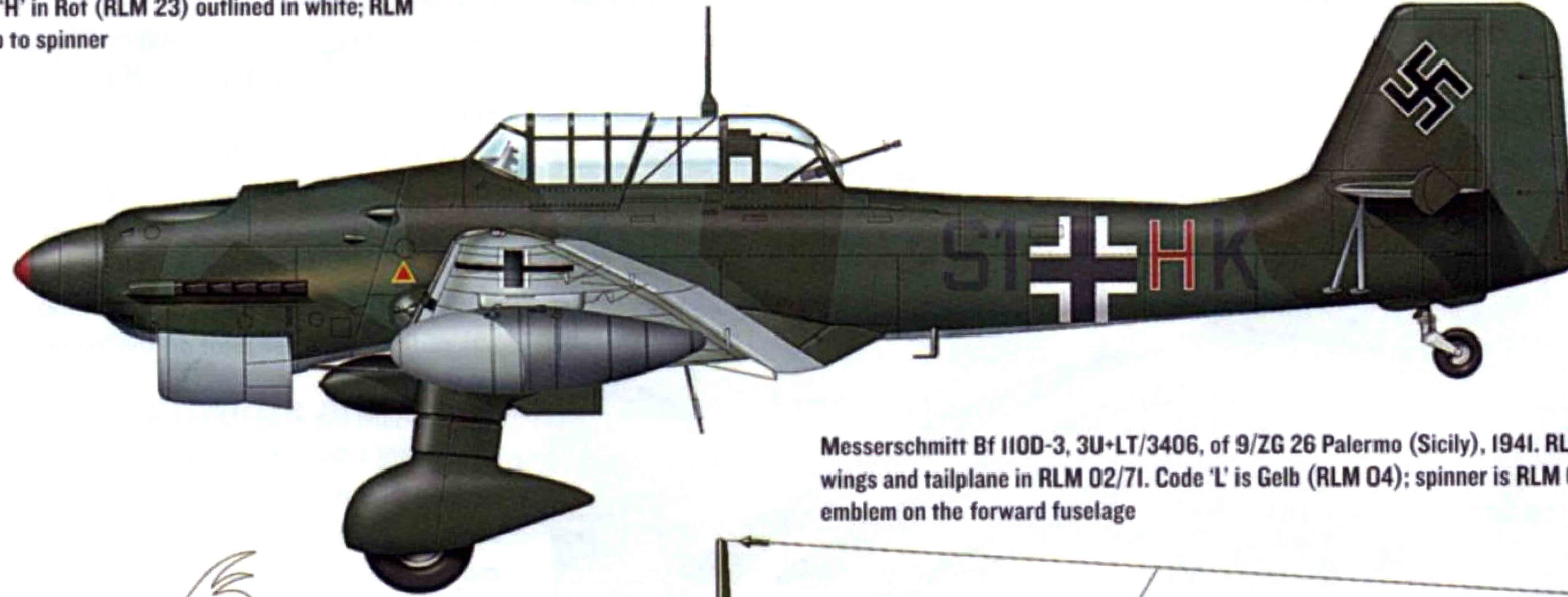


Above: Hawker Hurricane Mk IIb, HA-E (serial unknown), 'Death Warmed Up', flown by Plt Off Bill Hollis Hallett, No.261 Squadron, 1941. Typical Battle of Britain aircraft finish of Dark Earth/Dark Green/Sky with Black spinner and Light Grey codes. Note absence of Vokes filter

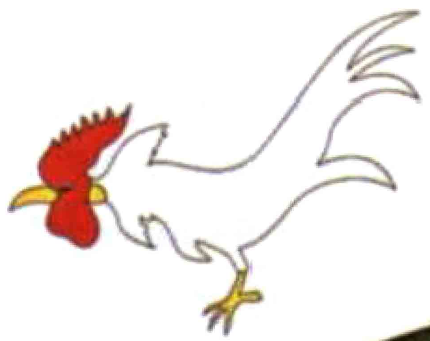


Above: Macchi C.200, 79-8 of the 79a Squadriglia (6° Gruppo, I° Stormo), Catania-Fontanarossa, February 1941. Verde Mimetico upper surfaces with Giallo Mimetico and Marrone Mimetico mottling; Grigio Mimetico undersides. Engine cowling is in Giallo Cromo while an unusually large cross is painted on the fin and rudder in white; tail cone is also white. Underwing roundels are black with white fasces; those on top are white with black fasces

Below: Ju 87R, SI+HK, I/StG3, Fliekerkorps X, Sicily, January 1941. RLM 70/71/65 finish with code 'H' in Rot (RLM 23) outlined in white; RLM 23 tip to spinner



Messerschmitt Bf 110D-3, 3U+LT/3406, of 9/ZG 26 Palermo (Sicily), 1941. RLM 65 overall with RLM 02/71 mottling on fuselage; top of wings and tailplane in RLM 02/71. Code 'L' is Gelb (RLM 04); spinner is RLM 04 and RLM 70. Note RLM 04 patch on rudder and unit emblem on the forward fuselage



Junkers Ju 88A-5, L1+GR, of III/LG based at Catania, early 1941. RLM 70/71/65 scheme with white bands around the spinner, front of cowlings and fuselage. Codes are black with 'G' in white. Note 'G' repeated under wingtips

scale: 1/72

0 METRES 1 2

0 FEET 3 6

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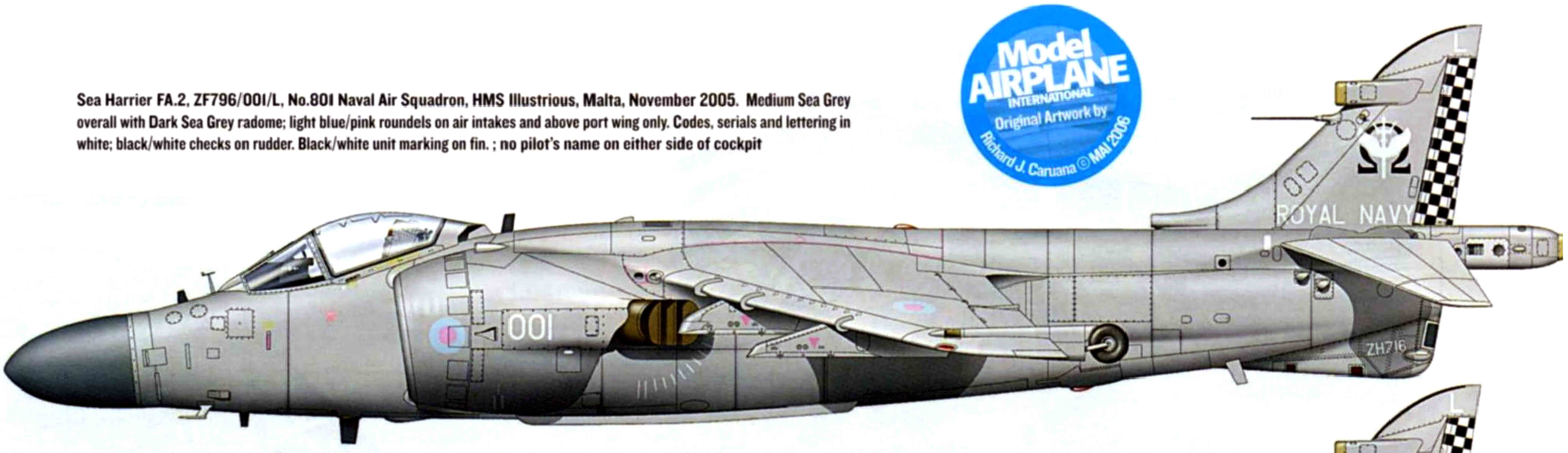
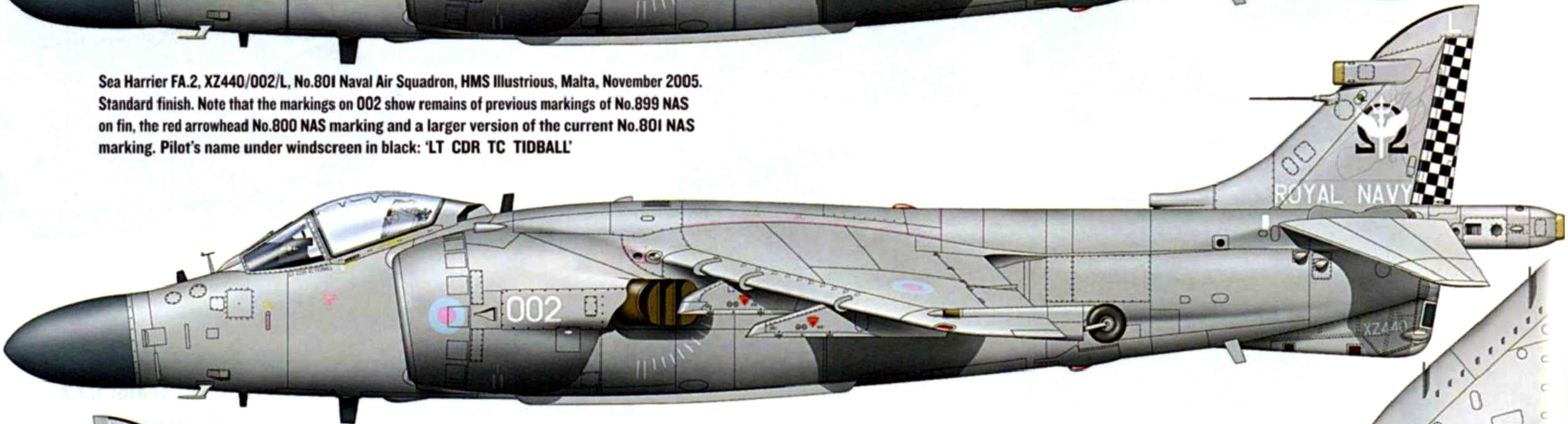
Sea Harrier FA.2, ZF796/001/L, No.801 Naval Air Squadron, HMS Illustrious, Malta, November 2005. Medium Sea Grey overall with Dark Sea Grey radome; light blue/pink roundels on air intakes and above port wing only. Codes, serials and lettering in white; black/white checks on rudder. Black/white unit marking on fin. ; no pilot's name on either side of cockpit

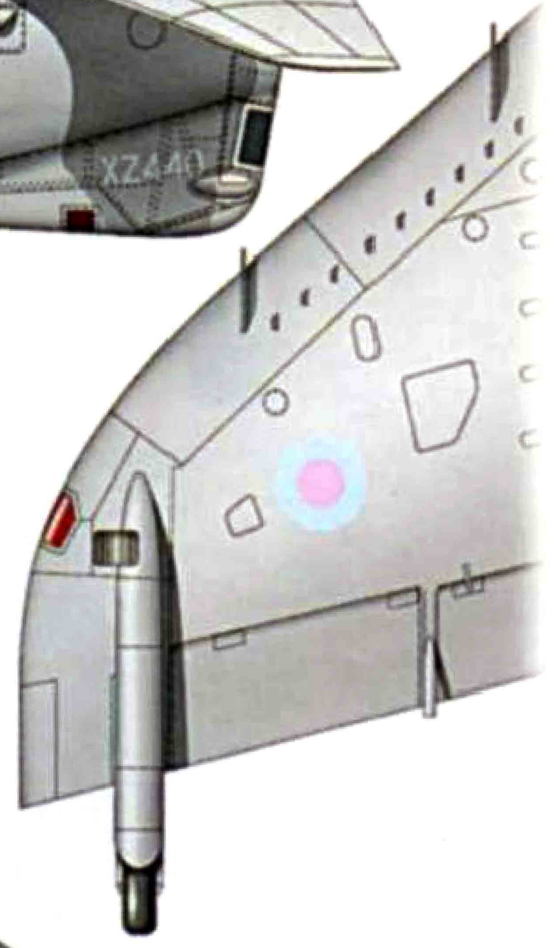


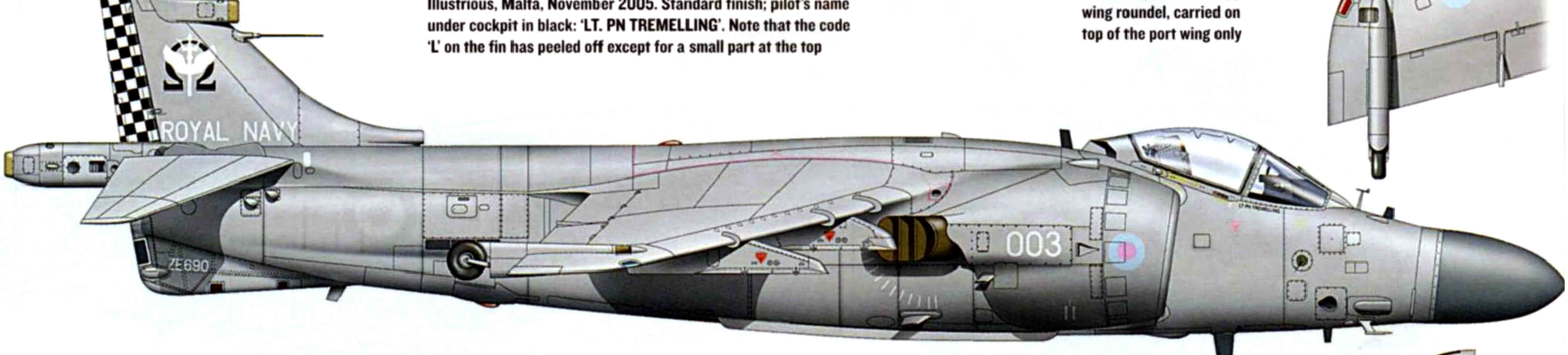
Sea Harrier FA.2, XZ440/002/L, No.801 Naval Air Squadron, HMS Illustrious, Malta, November 2005. Standard finish. Note that the markings on 002 show remains of previous markings of No.899 NAS on fin, the red arrowhead No.800 NAS marking and a larger version of the current No.801 NAS marking. Pilot's name under windscreen in black: 'LT CDR TC TIDBALL'



Sea Harrier FA.2, ZE690/003, No.801 Naval Air Squadron, HMS Illustrious, Malta, November 2005. Standard finish; pilot's name under cockpit in black: 'LT. PN TREMELLING'. Note that the code 'L' on the fin has peeled off except for a small part at the top

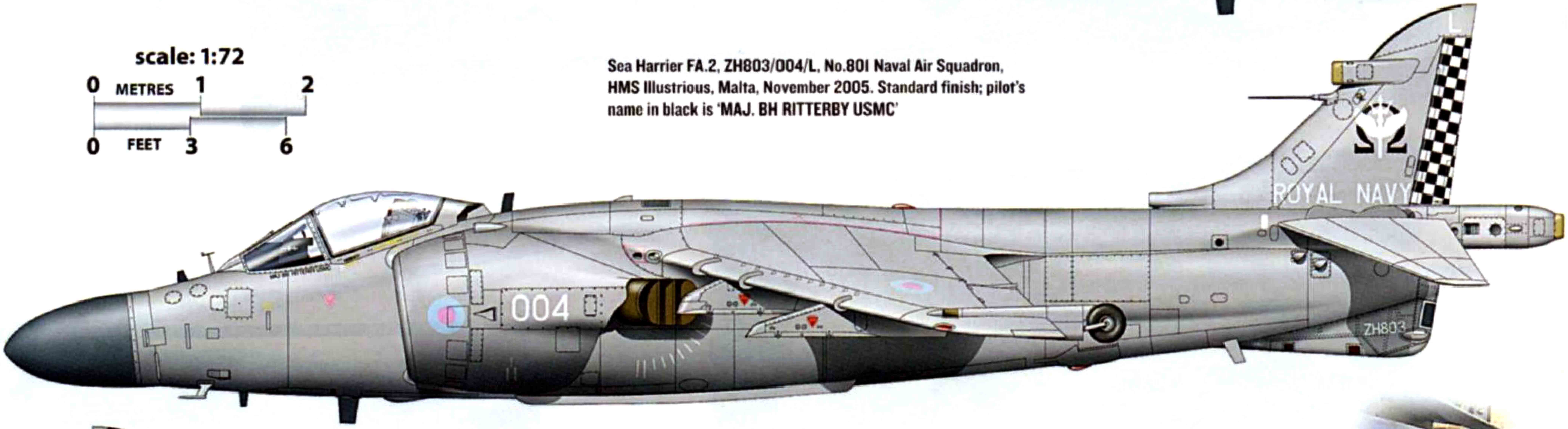
Scrap view at right shows standard position of upper wing roundel, carried on top of the port wing only





scale: 1:72
0 METRES 1 2
0 FEET 3 6

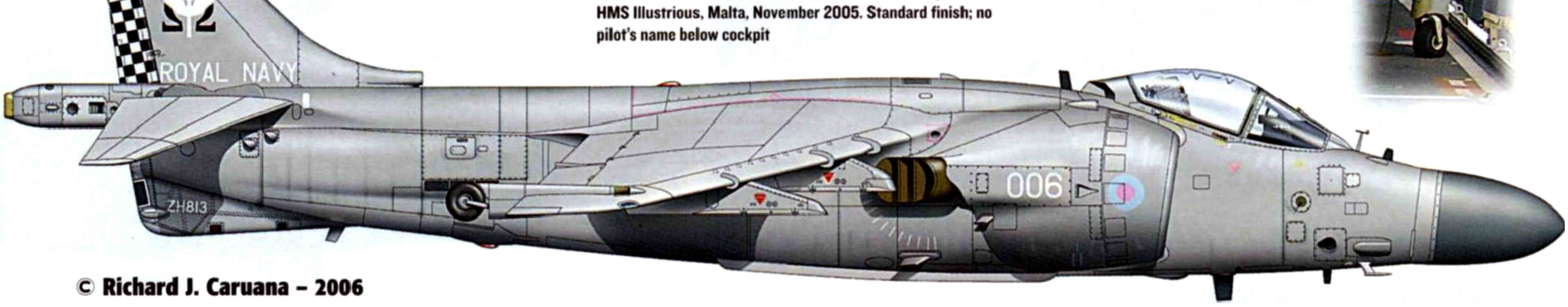
Sea Harrier FA.2, ZH803/004/L, No.801 Naval Air Squadron, HMS Illustrious, Malta, November 2005. Standard finish; pilot's name in black is 'MAJ. BH RITTERBY USMC'



Note: There was no '005' on board; the sixth Sea Harrier on board was ZH804/007/L which was in disassembled form inside the hangar (see main feature for details)

Photo detail showing last digit of code repeated on front of outrigger wheel covers, on all aircraft

Sea Harrier FA.2, ZH813/006/L, No.810 Naval Air Squadron, HMS Illustrious, Malta, November 2005. Standard finish; no pilot's name below cockpit



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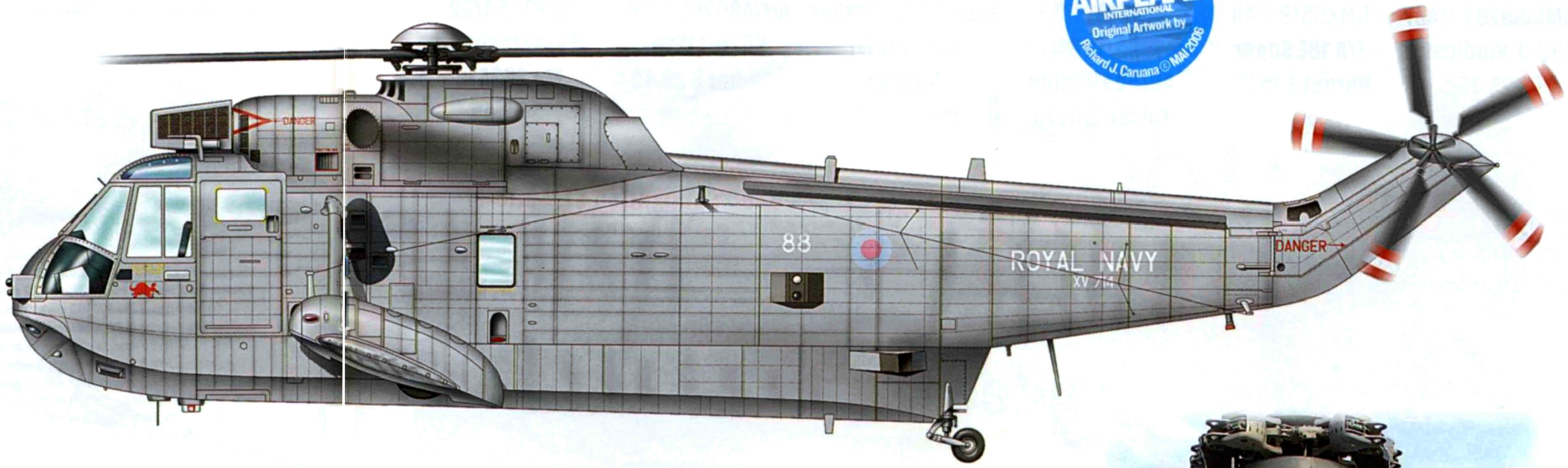

Above: Sea King ASaC, XV714/88, No. 849 (A) Flight, HMS Illustrious, Malta, November 2005. Medium Sea Grey overall with white markings; pink/light blue roundels. Unit marking below cockpit (both sides) and centrally on nose; '88' repeated in white on nose, below cockpit framing (See photo detail at far left)

scale: 1:72
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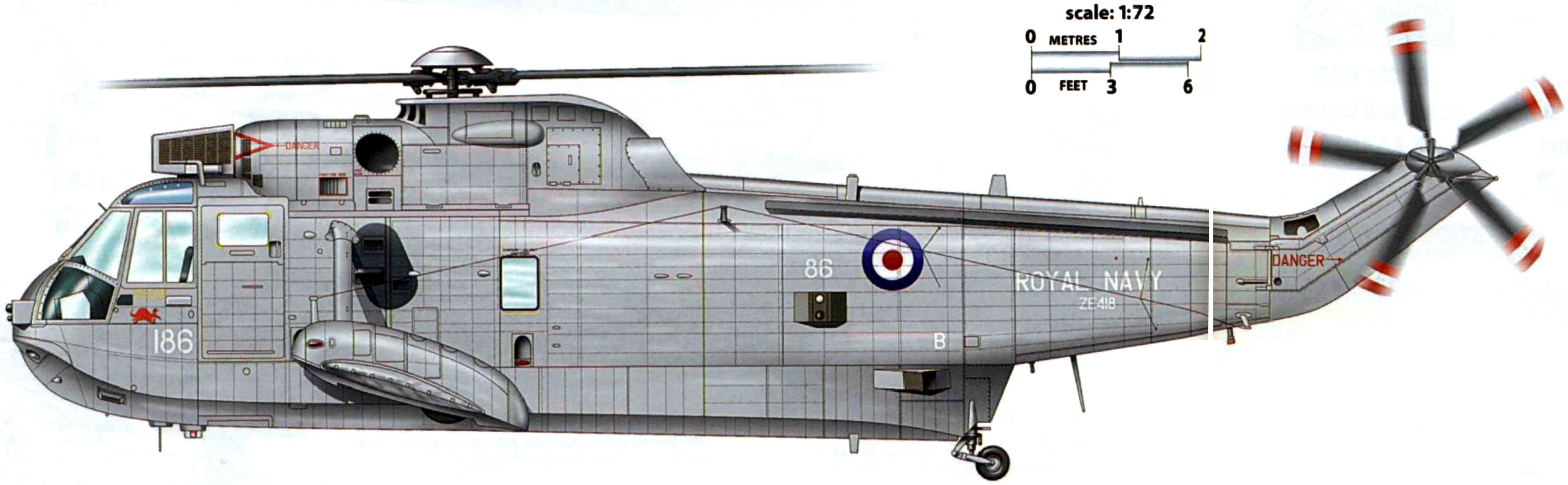
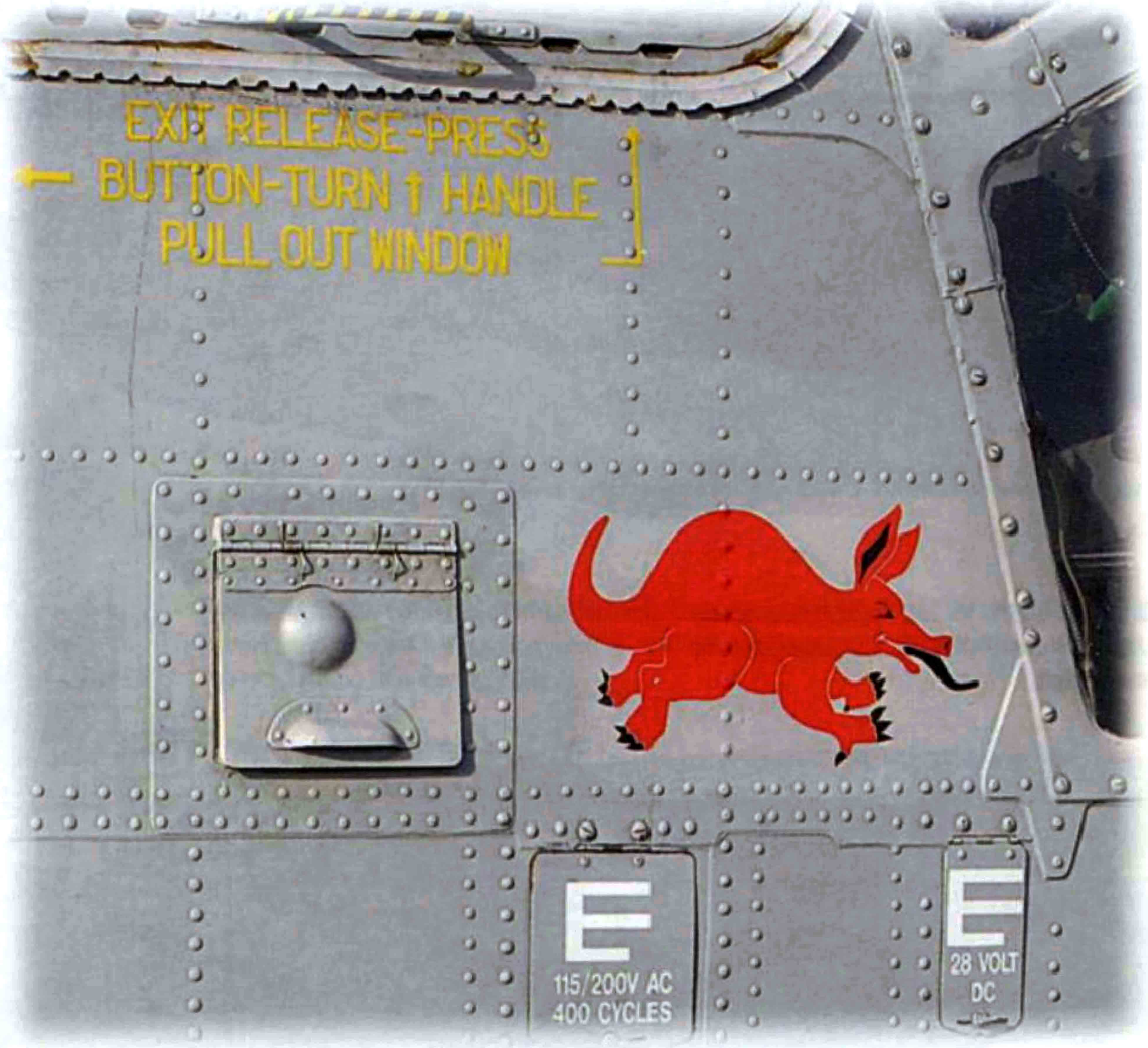
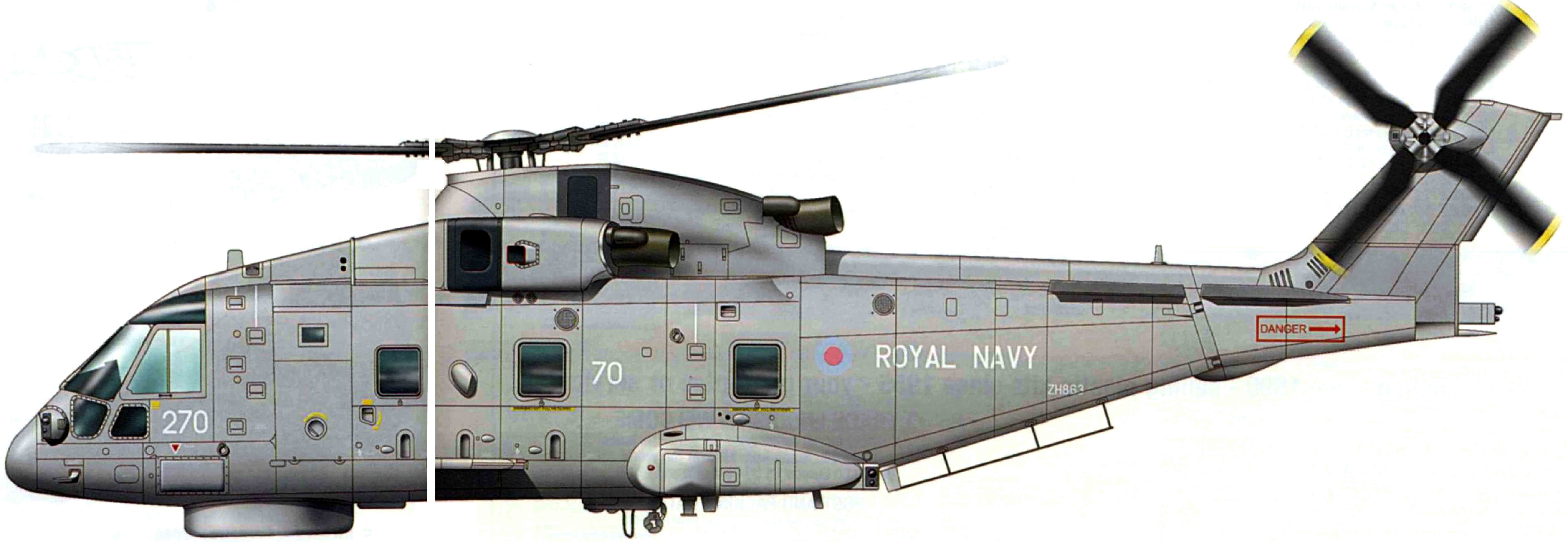


Left: Sea King ASaC, ZE418/B-186, No. 849 (A) Flight, HMS Illustrious, Malta, November 2005. High gloss Medium Sea Grey overall with all markings in white; roundels in bright blue/white/red finish. Unit marking in dayglo red under cockpit (both sides) and centrally on nose; '86' in white also repeated on nose, below cockpit framing (see marking detail in photo at bottom, far left)

Below: Merlin HM Mk I, ZH863/270, HMS Illustrious, Malta, November 2005. Medium Sea Grey overall with all markings in white; light blue/pink roundels on both sides of fuselage. '70' repeated on nose (see photo detail at right)





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Douglas F3D-2 Skyknight, BuNo.125371/106-T, VF-11 'Red Rippers', 1953. Sea Blue Gloss overall with red/white trim to front fuselage sides, air intakes and fin/rudder top; black radome. Standard national markings on fuselage sides, above port and below starboard wings; '106T' in white above starboard wing

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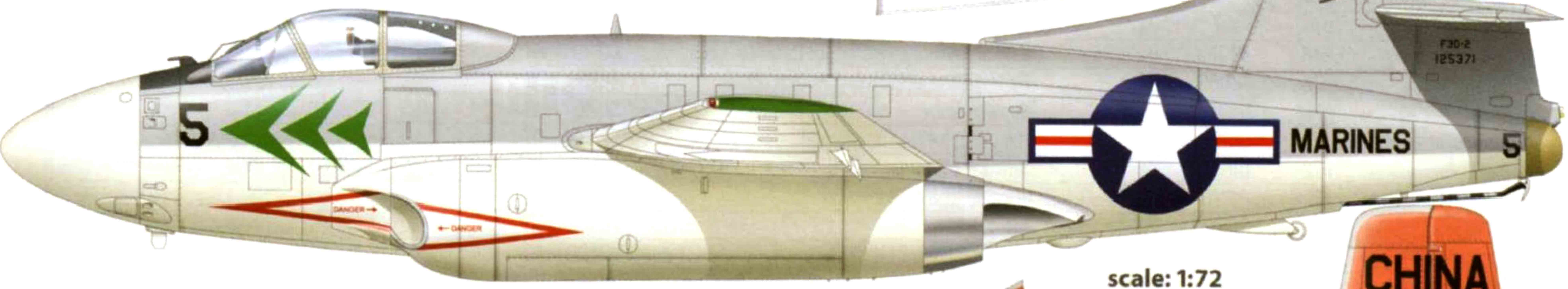
Douglas F3D-2 Skyknight, BuNo.127038/ATG-404, VF-14 'Tophats', USS Intrepid, 1954. Sea Blue Gloss overall with yellow trim to forward fuselage, wingtips and top of fin/rudder; black radome and anti-dazzle panel. Standard national markings; all lettering in white except '303' on top of tail which is in black. 'ATG' repeated in white above starboard wing

Douglas F3D-2 Skyknight, WF/23A, VMF(N)-513, March 1953. Sea Blue Gloss overall with national markings in standard positions; codes on nose and tail in dull red. Note two kill markings under cockpit. The first was scored by Maj W.T. Sratton Jr/MSgt H.T. Hoagland on 3/11/52 (Yak-15, first jet-vs-jet night kill); the second by Lt Col R.F. Conley/MSgt J.F. Scott on 31/1/53 (MiG-15)

Douglas F3D-2T2 Skyknight, BuNo.125873/BP-5, VMF(N)-20, 1955. Gull Grey uppersurfaces with Insignia White undersides and top of control surfaces; with green chevrons on nose, wingtips and rudder. Leading edges of all flying areas in silver. Standard national markings in usual positions; all lettering in black, including '5BP' above starboard wing



Douglas F3D-2T2 Skyknight, BuNo.125807, China Lake, 1961. White/dayglo orange-red finish with black radome and anti-dazzle panel; silver leading edges of all flying surfaces. Standard national markings positions; markings in black

scale: 1:72

0 METRES 1 2

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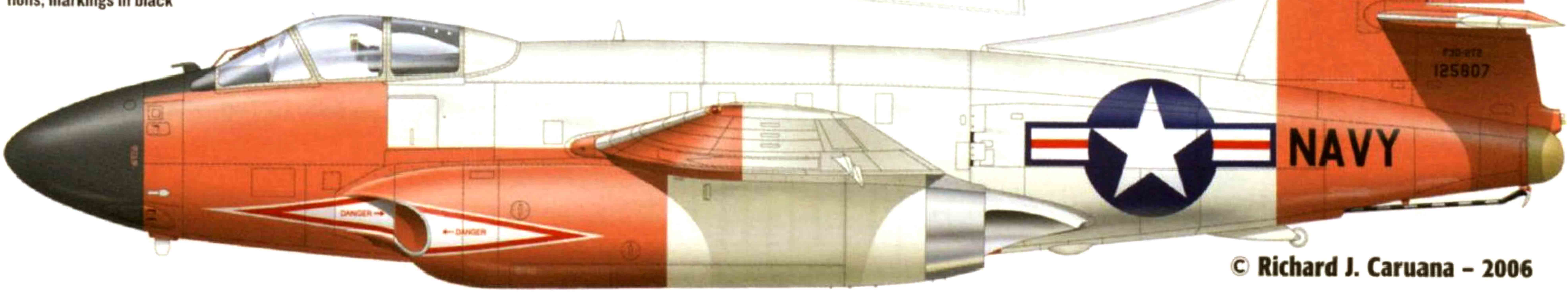

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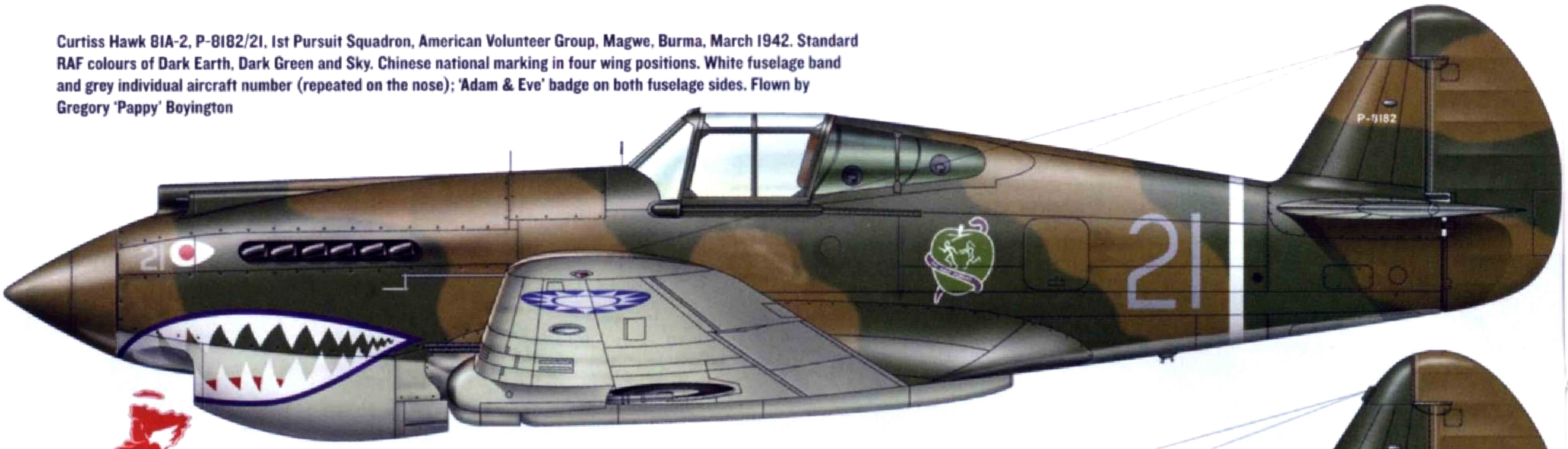
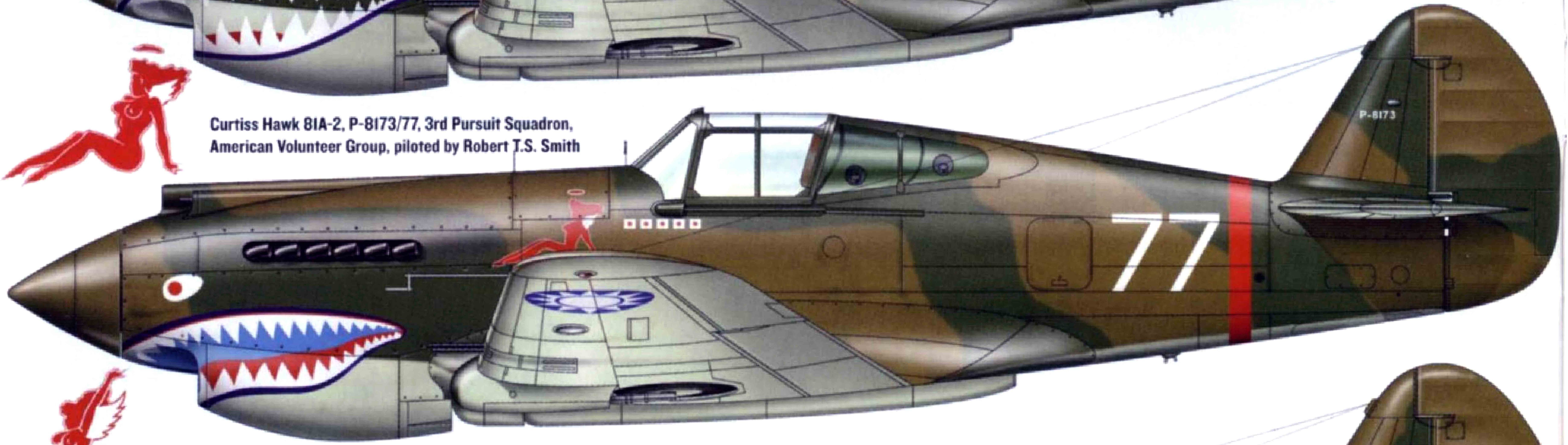
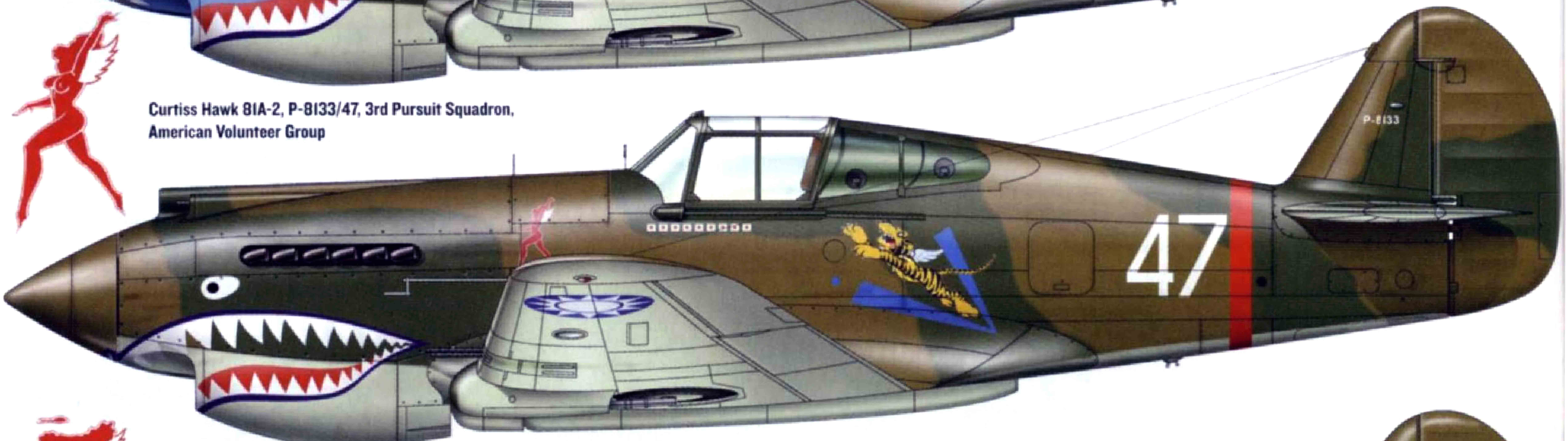
Curtiss Hawk 81A-2, P-8182/21, 1st Pursuit Squadron, American Volunteer Group, Magwe, Burma, March 1942. Standard RAF colours of Dark Earth, Dark Green and Sky. Chinese national marking in four wing positions. White fuselage band and grey individual aircraft number (repeated on the nose); 'Adam & Eve' badge on both fuselage sides. Flown by Gregory 'Pappy' Boyington

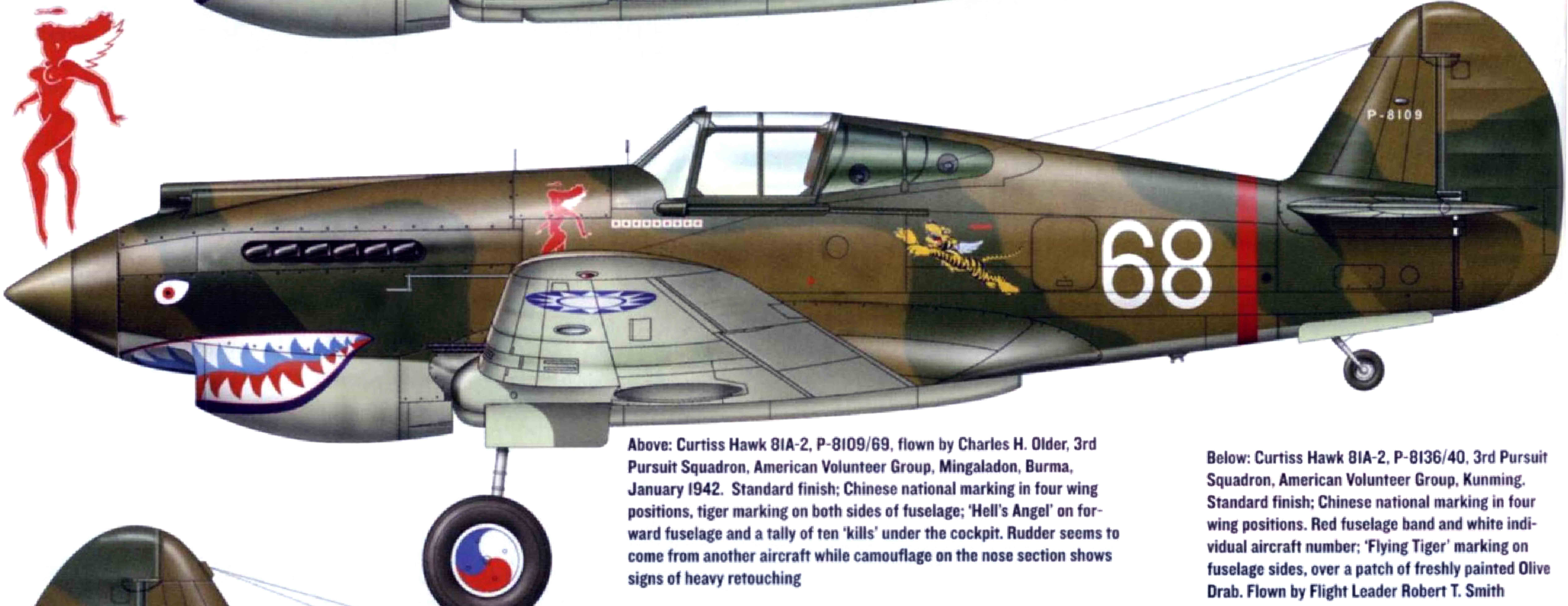


Curtiss Hawk 81A-2, P-8173/77, 3rd Pursuit Squadron, American Volunteer Group, piloted by Robert T.S. Smith



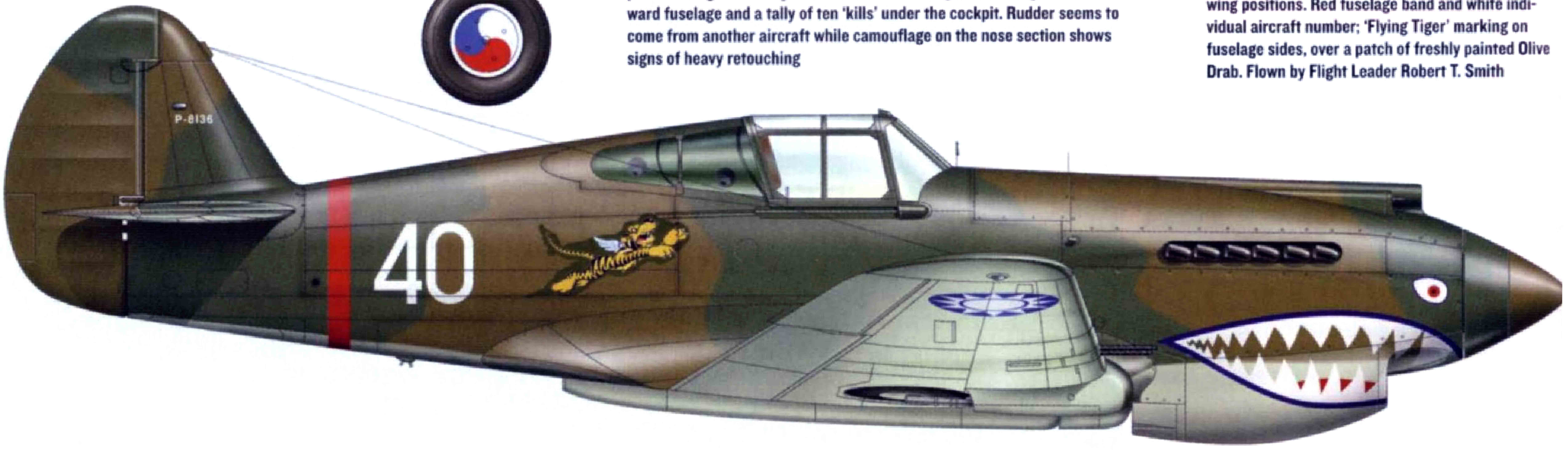
Curtiss Hawk 81A-2, P-8133/47, 3rd Pursuit Squadron, American Volunteer Group





Above: Curtiss Hawk 81A-2, P-8109/69, flown by Charles H. Older, 3rd Pursuit Squadron, American Volunteer Group, Mingaladon, Burma, January 1942. Standard finish; Chinese national marking in four wing positions, tiger marking on both sides of fuselage; 'Hell's Angel' on forward fuselage and a tally of ten 'kills' under the cockpit. Rudder seems to come from another aircraft while camouflage on the nose section shows signs of heavy retouching

Below: Curtiss Hawk 81A-2, P-8136/40, 3rd Pursuit Squadron, American Volunteer Group, Kunming. Standard finish; Chinese national marking in four wing positions. Red fuselage band and white individual aircraft number; 'Flying Tiger' marking on fuselage sides, over a patch of freshly painted Olive Drab. Flown by Flight Leader Robert T. Smith



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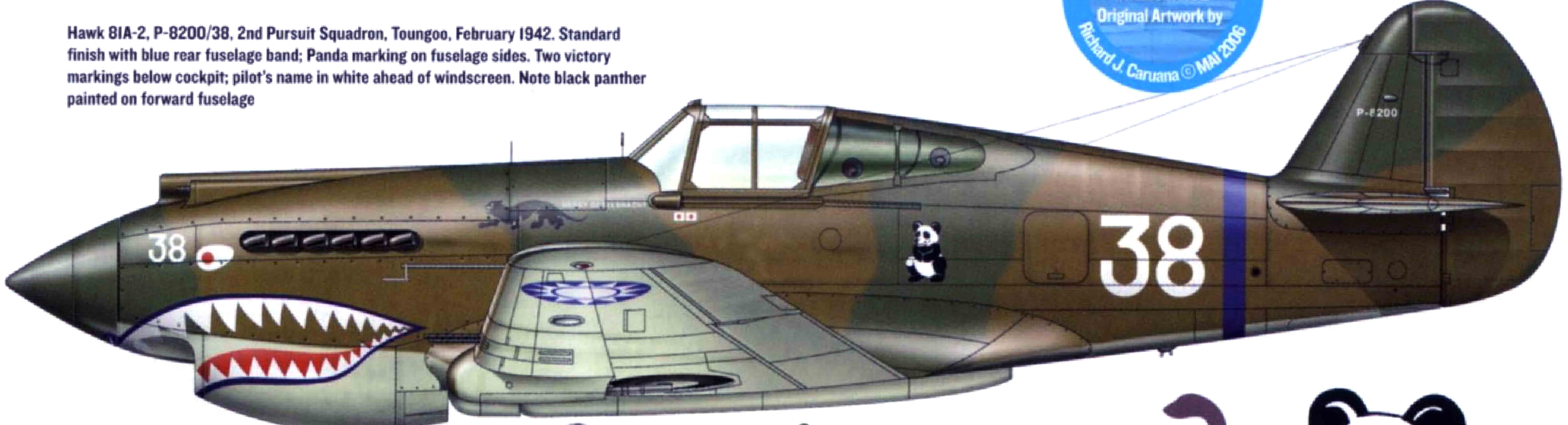
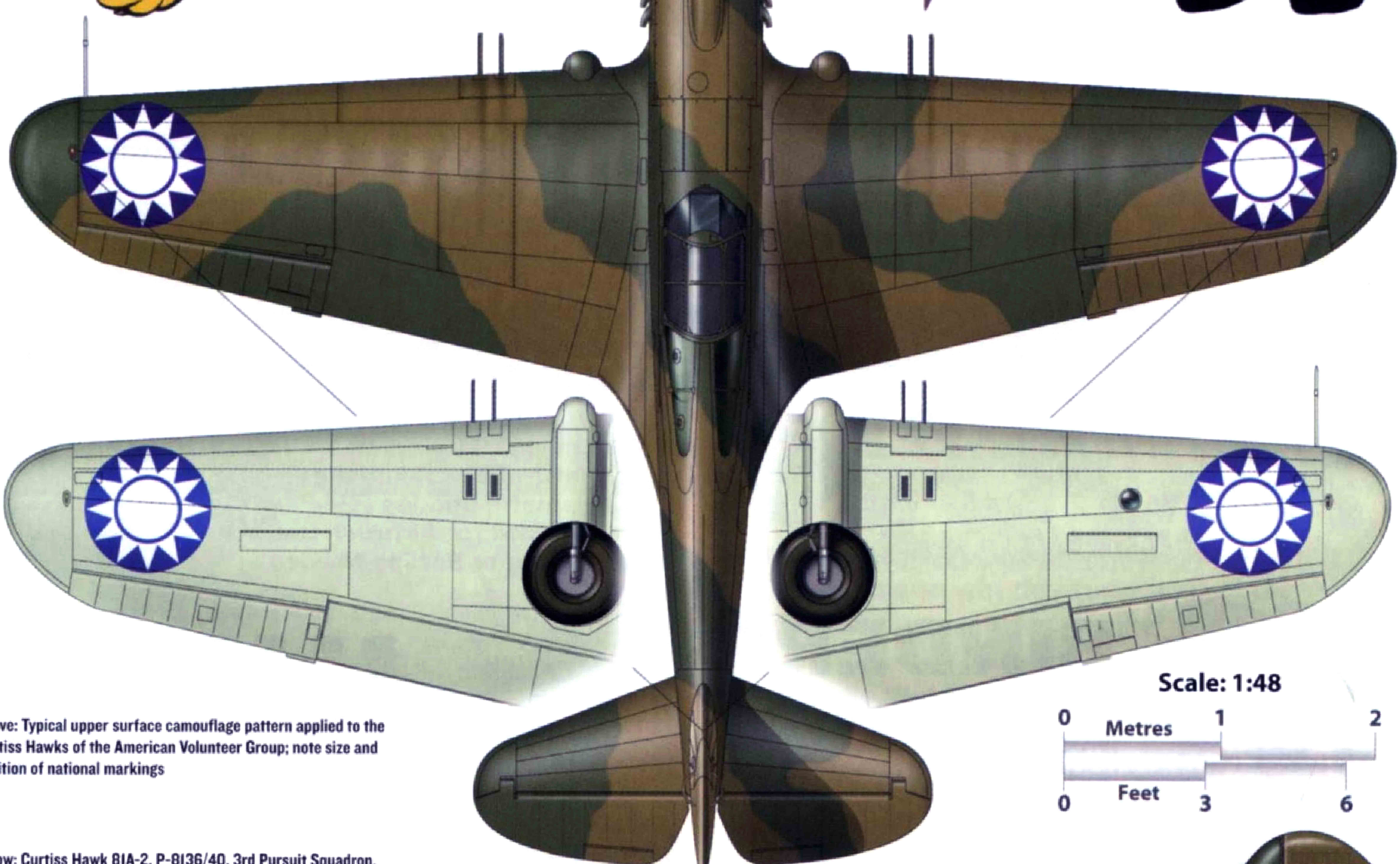
Hawk 81A-2, P-8200/38, 2nd Pursuit Squadron, Toungoo, February 1942. Standard finish with blue rear fuselage band; Panda marking on fuselage sides. Two victory markings below cockpit; pilot's name in white ahead of windscreen. Note black panther painted on forward fuselage





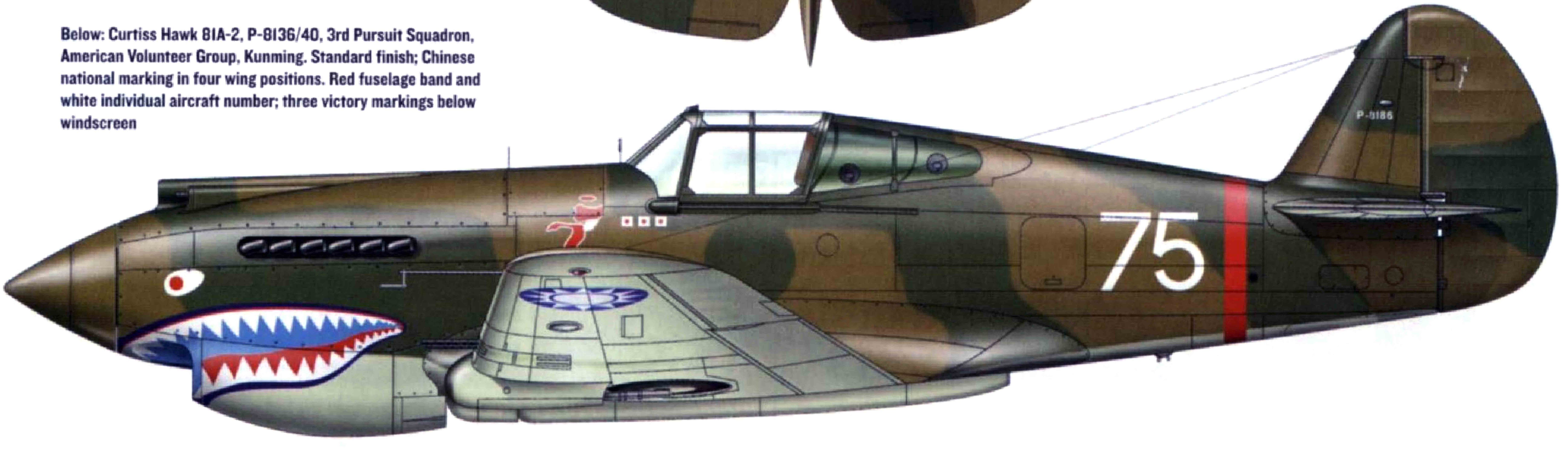
Above: Typical upper surface camouflage pattern applied to the Curtiss Hawks of the American Volunteer Group; note size and position of national markings

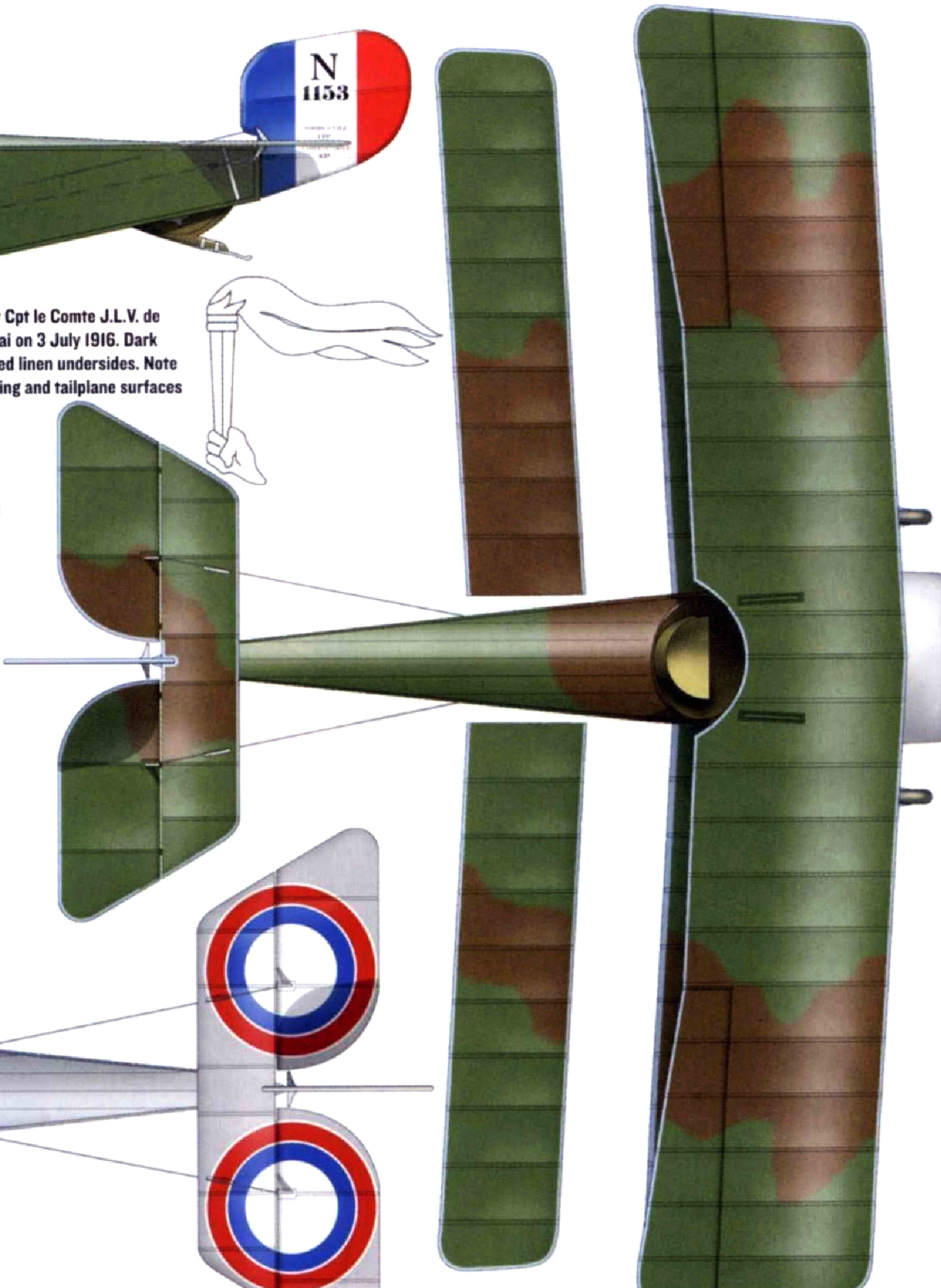
Scale: 1:48

0 Metres 1 2

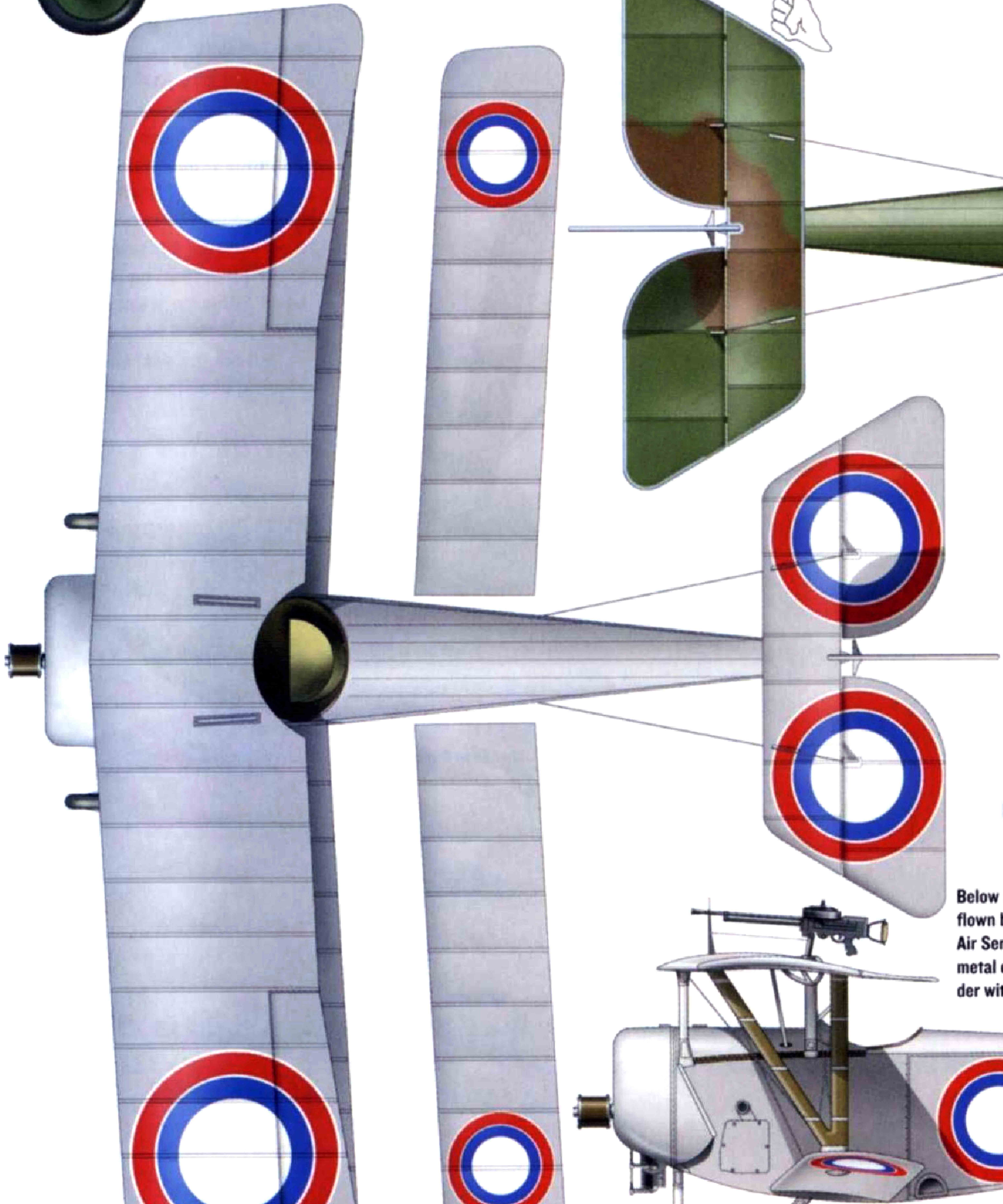
0 Feet 3 6

Below: Curtiss Hawk 81A-2, P-8136/40, 3rd Pursuit Squadron, American Volunteer Group, Kunming. Standard finish; Chinese national marking in four wing positions. Red fuselage band and white individual aircraft number; three victory markings below windscreen

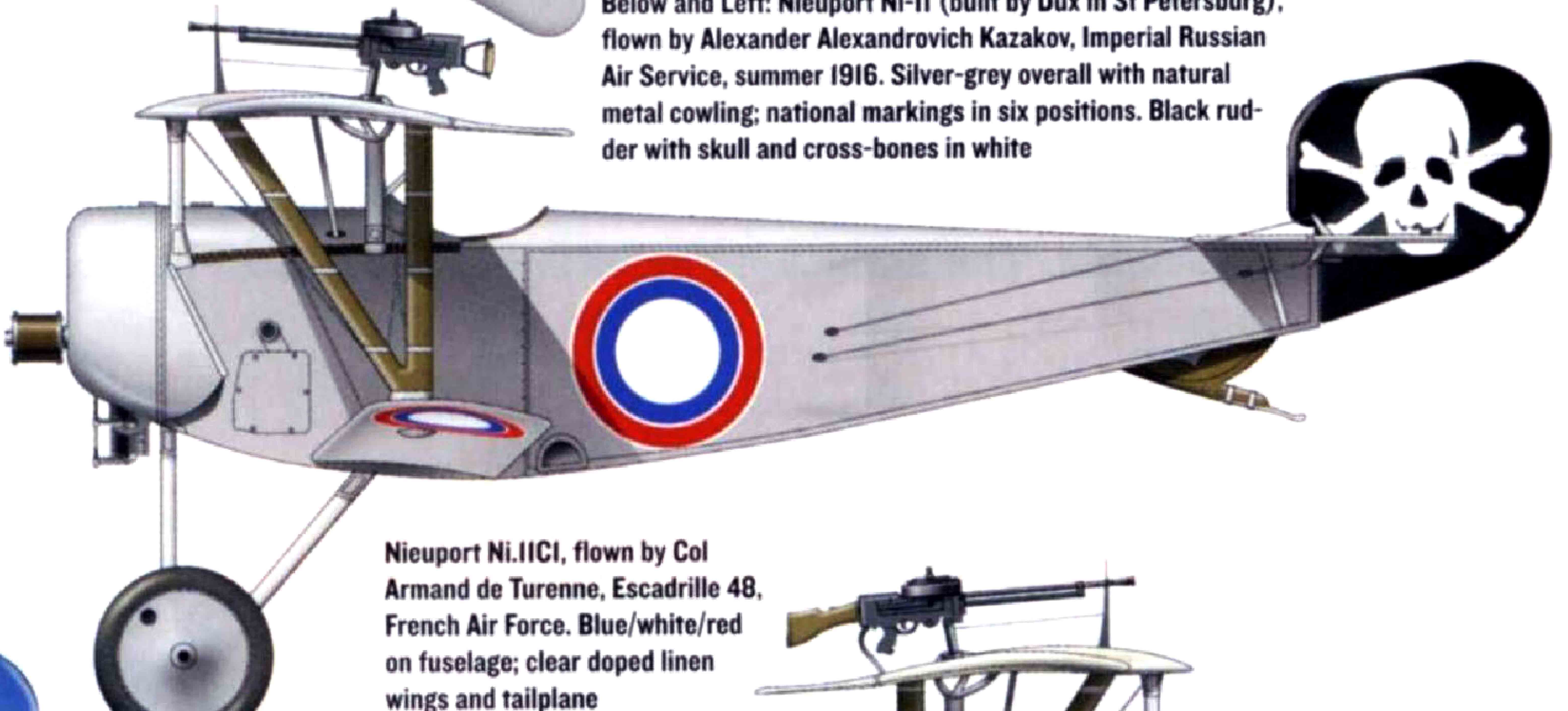




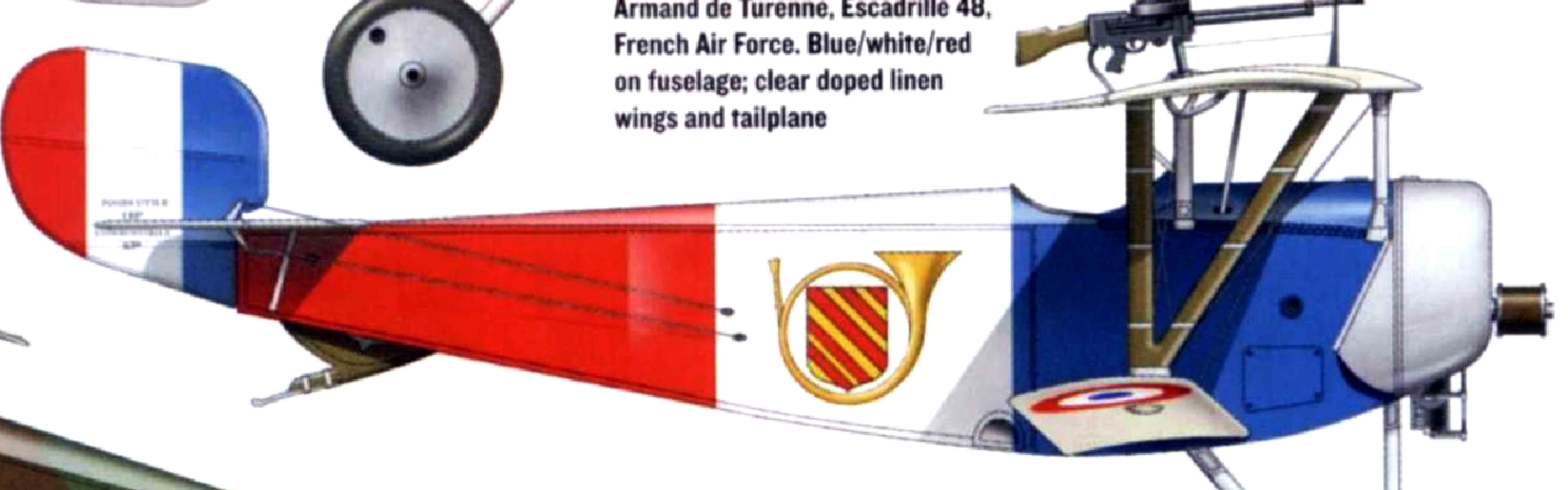
Above and Right: Nieuport Ni.11, N.1153, flown by Cpt le Comte J.L.V. de Plandes Sièyes, Escadrille 26, downed near Douai on 3 July 1916. Dark brown/dark green uppersurfaces with clear doped linen undersides. Note thin edge in light blue around all camouflaged wing and tailplane surfaces



Below and Left: Nieuport Ni-11 (built by Dux in St Petersburg), flown by Alexander Alexandrovich Kazakov, Imperial Russian Air Service, summer 1916. Silver-grey overall with natural metal cowling; national markings in six positions. Black rudder with skull and cross-bones in white



Nieuport Ni.11C1, flown by Col Armand de Turenne, Escadrille 48, French Air Force. Blue/white/red on fuselage; clear doped linen wings and tailplane



Nieuport Ni.11, 131, flown by Chouteau Johnson, Escadrille N124, French Air Force, summer 1916

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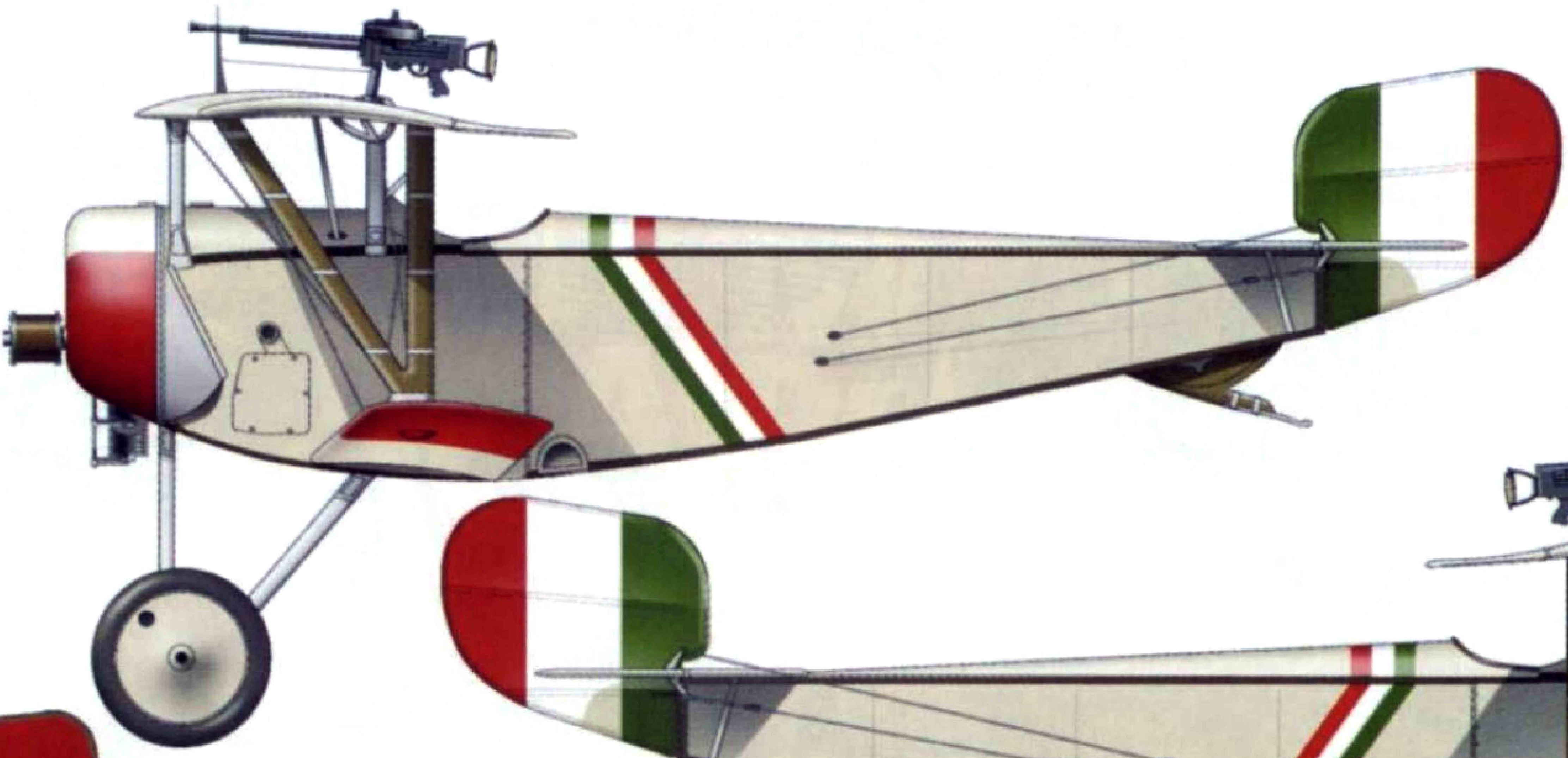
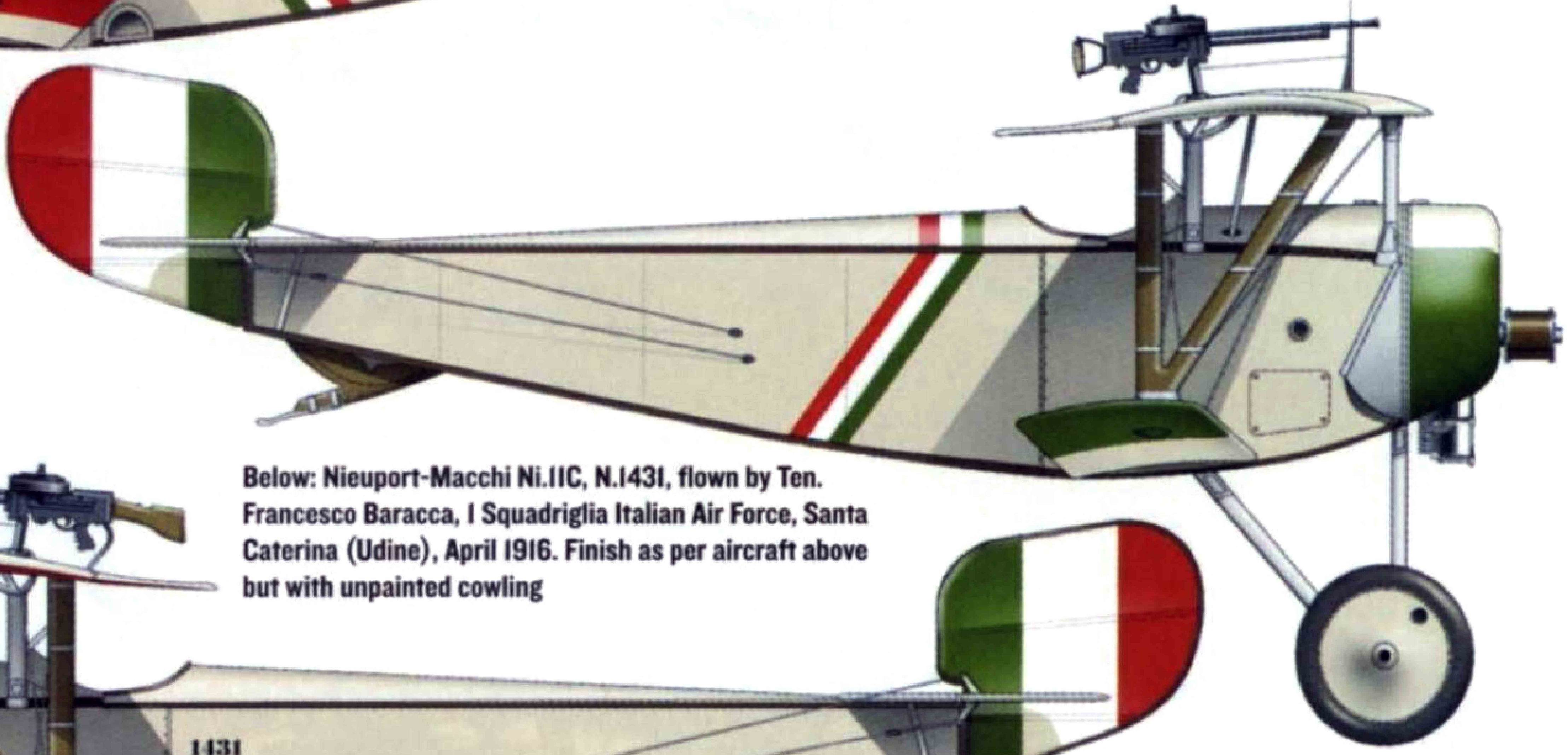
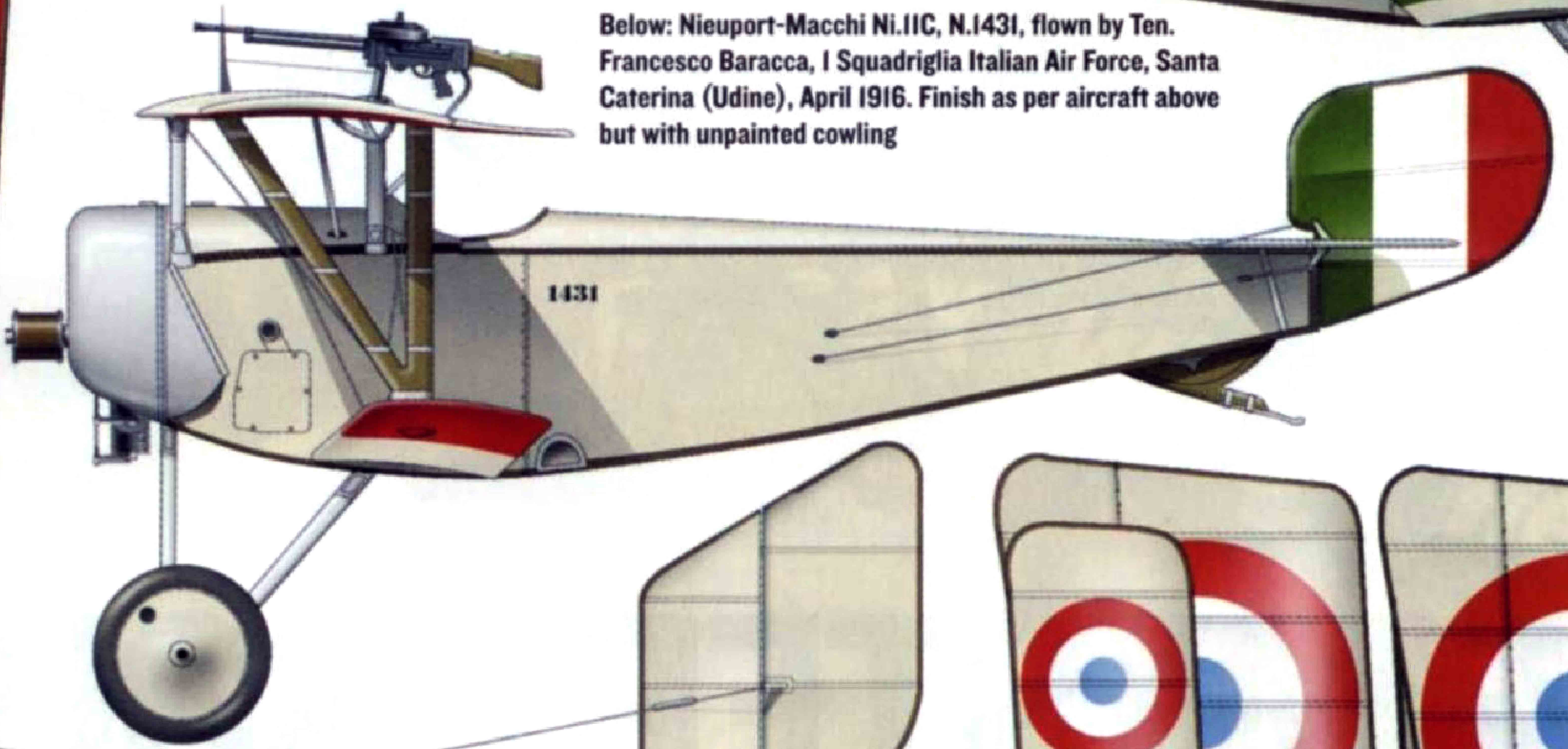
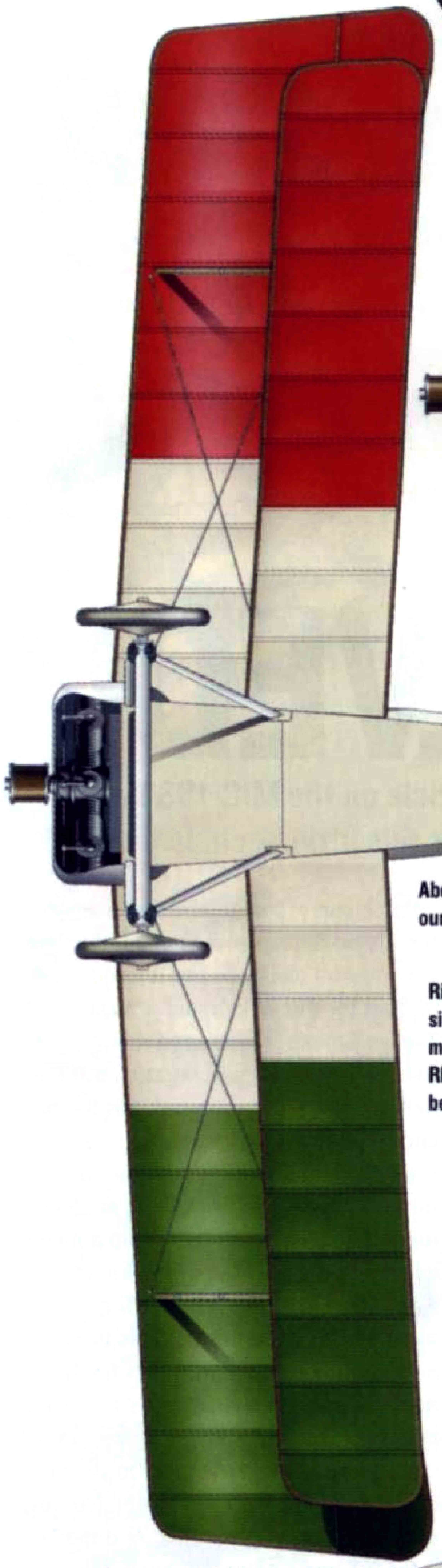


Right (both views) : Nieuport-Macchi Ni.11C 'Bebè', Italian Air Force, 1916. Clear doped linen overall with green/white/red rudder and cowling; undersides of wings in red (port), clear doped linen (centre section) and green (starboard). Green/white/red band above and on sides of fuselage

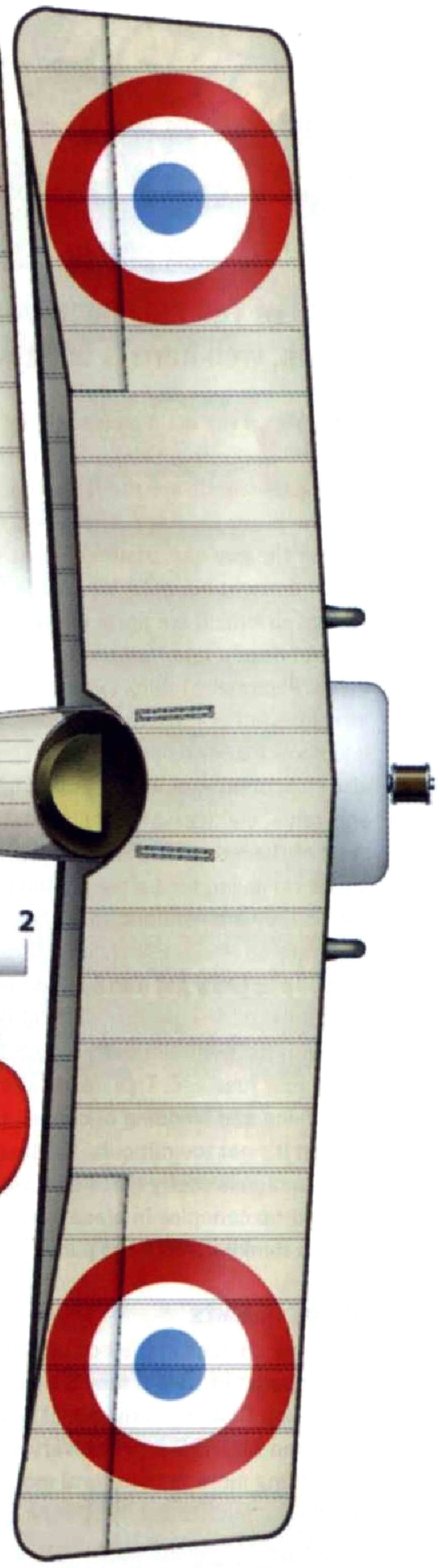


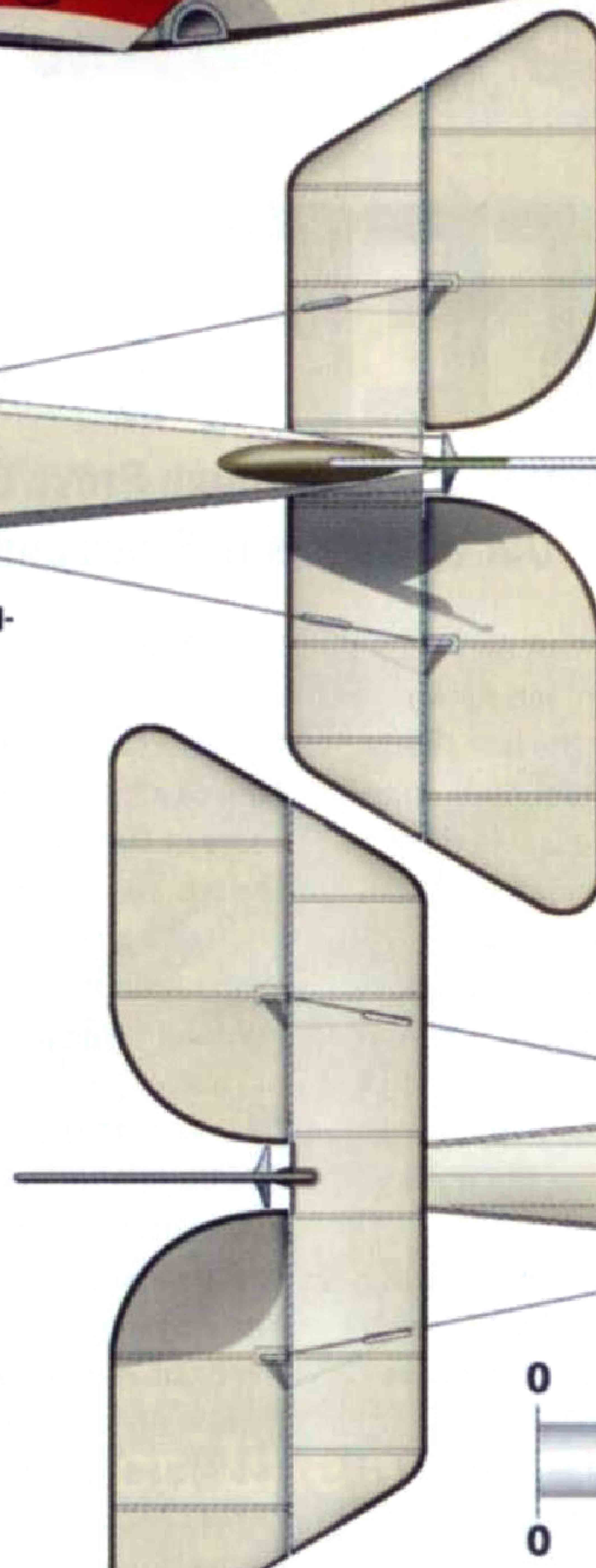


Below: Nieuport-Macchi Ni.11C, N.1431, flown by Ten. Francesco Baracca, I Squadriglia Italian Air Force, Santa Caterina (Udine), April 1916. Finish as per aircraft above but with unpainted cowling

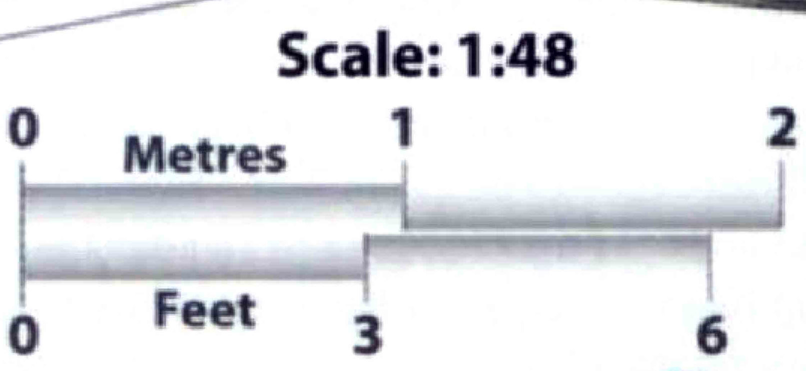


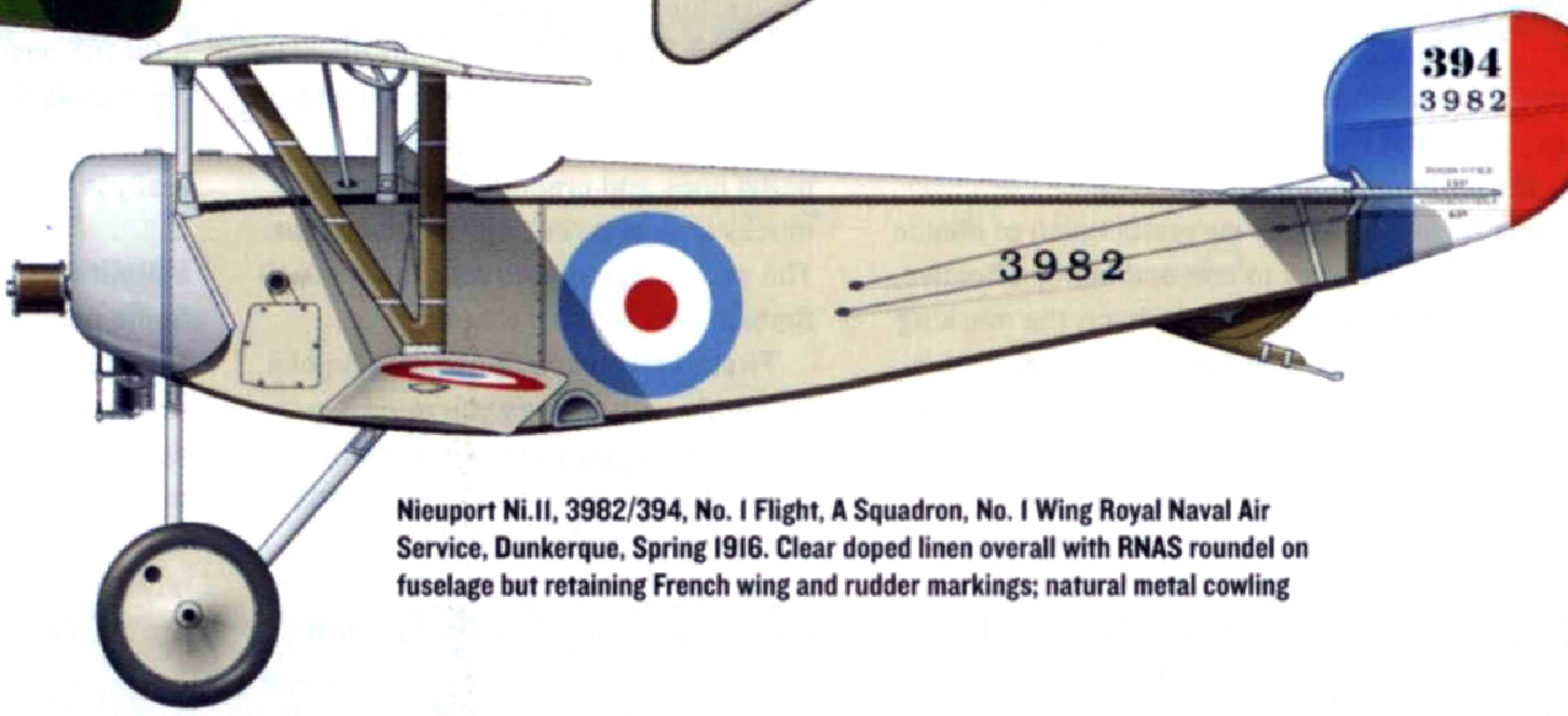
Above: Typical undersides wing colours of Italian Ni.11s





Right: Typical upper and undersides position of French national markings, usually retained on RNAS aircraft as on the example below





Nieuport Ni.11, 3982/394, No. 1 Flight, A Squadron, No. 1 Wing Royal Naval Air Service, Dunkerque, Spring 1916. Clear doped linen overall with RNAS roundel on fuselage but retaining French wing and rudder markings; natural metal cowling

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THE BAe/HS.125 IN ROYAL

The Series 1B was the first HS.125 to enter military service when the RAF ordered 20 in 1984 as Dominie T Mk 1s

Back in the late 'sixties and throughout most of the 'seventies, when Royal Air Force (RAF) Station Luqa was a continuous hive of activity, Friday afternoons provided a real spectacle to any aeroplane spotter. Runway 24-06 was the one used for military movements, ideal for photography from both ends and along most of both sides. Very often, dozens of NATO aircraft sought 'refuge' at Malta for the weekend after completing their training on the ranges of Decimomannu. For, while the ranges in Sardenia are an ideal training ground, the hospitality in and around the base is not renowned for its excitement!

However, there were other visitors who came directly to the Mediterranean Isle on long-flight training missions, and among these one fondly remembers the gaggle of grey, white and scarlet Dominies from No.6 Flying Training School (FTS) flying in at ten to fifteen minute intervals. Departure on Monday morning was just as exciting an experience, as the six or seven Dominies T.1 taxied down the runway to line up for take-off to start their journey back home.

Originally launched by a de Havilland (DH) design team at Hatfield under the auspices of J. Goodwin way back in 1961, the HS. 125 progressed over the years to become one of the best selling biz-jets on the international market. Faced by fierce competition from giant firms across the Atlantic, such as Cessna and Learjet, the HS.125 was to be produced in close to 1,000 examples in eight major series, the 128-800 alone accounting for over 400 aircraft, built by British Aerospace and Raytheon. This impressive production run is accompanied by a very significant fact: over 60 percent of sales went to the American market, especially following

AIR FORCE SERVICE

WRITTEN BY RICHARD CARUANA.

the December 1969 agreement whereby Beech Aircraft took over responsibility of sales in North American and Mexico.

The D.H.125, temporarily christened 'Jet Dragon' in memory of DH's first twin-engined transport aircraft – the D.H.84 of 1932 – was mainly intended as a business transport aircraft with accommodation for six to eight passengers and a crew of two. Two prototypes were built, the first of which (G-ARYA) flew for the first time on 13 August 1962. It was powered by a pair of Bristol-Siddeley Viper 520 turbojets, each providing 3,000lb (1,361kg) thrust, positioned at the rear of the fuselage. It featured a low-set, all-metal cantilever wing with a swept leading and trailing edges, tapering in chord towards the tip. The tricycle undercarriage was completely retractable, with twin wheels fitted to each unit; the nose gear retracted forward into the fuselage while the main gear retracted into the wing root.

Wing span and fuselage length were increased by three feet each (915mm) on the first production series (Series I), of which 82 examples were eventually built at Chester, when de Havilland became part of the Hawker Siddeley Group. The first production aircraft in this series flew for the first time on 12 February 1963. The Series I was built in two versions, with an 'A' suffix denoting aircraft destined for the United States (US) market, while those bearing the 'B' suffix were marketed by the parent company in the United Kingdom (UK). It was the latter version that was to be the first to enter military service when the RAF chose the HS.125 in 1964 to serve in the navigation trainer role from RAF Stradishall. An order for 20 examples (XS709-714, XS726-739) suitably modified for this role was placed under the designation of Dominie T Mk I.

THE DOMINIE TRAINER

Based on the civil Series IB, the aircraft destined for the RAF received the company designation of Series 2. All up weight increased from 20,000lb (9092kg) to 21,200lb (9612kg) and it was identified externally by a ventral fin and an enlarged wing centre section fairing housing Decca Doppler electronic equipment. It also featured six windows on the port side and four on starboard. The first Dominie T Mk I (XS709) performed its maiden flight with the temporary registration G-37-65 on 30 December 1964. It was delivered to the RAF on 30 March 1965.

XS710, first flown on 1 February 1965, was delivered to the A&AEE, Boscombe Down on 23 March. Dominies XS732 to XS736 were delivered to the College of Air Warfare (CAW), RAF Manby, between 11 February and 6 April 1966. The remaining 14 Dominies were assigned to the No.1 Air Navigation School (ANS) at Stradishall, starting from XS712 on 28 August 1965, where they replaced the ageing Meteor NF(T).14s. There they took over the high-speed jet-navigator training role, with the first course being completed in April 1966.

Eventually, No.1 ANS was transferred from Stradishall to Finningley where it became No.6 Flying Training School

(FTS). Apart from the long-haul flights to Malta, these Dominies often flew to Gibraltar and, occasionally, to Gatow in Germany. No.55 (Reserve) Squadron was reformed at RAF College Cranwell in November 1996, within No.3 FTS. On 1 November 2001 No.3 FTS and the Navigator and Airman Aircrew School were amalgamated to become No.55 (Reserve) Squadron thus providing all flying training for the RAF's future navigators. At that time it had 11 Dominie T Mk Is on strength.

No.55 (R) Squadron's tasks are, in actual fact, quite wider. It provides Ab Initio and Refresher courses for Navigators, Air Engineers, Weapons Systems Operators, Air Loadmasters and Air Signallers. This means that it trains some 160 students each year, for which it has a complement of 120 instructors. All Airmen and Aircrew Training is conducted at RAF College Cranwell. No.55's Navigator Training programme is carried out at three other stations apart from the College itself: RAF Topcliffe, RAF Leeming and RAF Shawbury. The Navigator Training section consists of the Initial Navigation Section, Fast Jet Training Flight, Basic Systems Navigation and Advanced Multi-Engined Training Flight.

Now painted all-black, except for a patch of white on top of the fuselage, Cranwell's Dominies are flown by a pilot and assistant pilot and have four seats in the cabin for students and their instructors. The aircraft are fitted with navigation instruments similar to those of RAF fast jets, allowing for information from the nose-mounted radar and integrated navigation equipment to be available to the student and instructor. Student navigators would have already graduated as junior officers from RAF College Cranwell's Initial Officer Training programme. Following eight months of flying on the Tutor, they move to RAF Topcliffe for 21 sorties of Tucano flying after which the students return to Cranwell for the Basic Dominie Module (BDM). This consists of six medium-level sorties where they become familiar with all

aspects of the aircraft's systems, radar navigation and mental dead-reckoning.

Students at Cranwell are then streamed into three categories: rotary wing, fast jet, and maritime. Fast-jet students can then start their 11-week navigation-training course on the Dominie. Sorties are flown in various height and speed parameters, over land and sea, and are now mainly restricted to UK airspace, with sorties sometimes flown to Europe. The overseas flight is usually linked to the 13th sortie of the 11-week long navigator course module on the Dominie, which also serves as a final test. Successful students streamed to fill navigator posts in fast jets move on to a 35-hour course on the Hawk at RAF Leeming before being posted to an Operational Conversion Unit (OCU). The Dominie course for maritime navigators is similar, lasting 12 weeks and concentrating on low and medium-level sorties.

Still flying today in the same role for which it was conceived, the Dominie T Mk I was updated several times, though external modifications have been very few indeed. Beginning in 1995, Marshalls of Cambridge were engaged in building a new nose structure and skinning for the Dominies to accommodate the new radar derived from the Lynx Seaspray IIRC. This entailed an increase in length of some 12 inches (305mm) and, judging from photographic evidence, this was done in two stages. An initial stage shows an extension but retaining the original nose cone (e.g. XS727 still seen as such in 2004), with a larger cone being fitted and faired into the front fuselage at some later stage. Also at around the time of that update, two windows on the port side (windows four and five from the front) were also blanked over. For a time these upgraded Dominies were referred to as T Mk 2s, but it has been established that this designation was never officially taken up.

As the Dominie seems to be irreplaceable in the role that it is assigned within the RAF, there are now plans for a further upgrade. It was announced on 24 January of this year, that Raytheon Systems Ltd (RSL) has been awarded a contract to supply Successor Identification Friend or Foe (SIFF) for nine Dominies T Mk I in service. Cost of this operation is £4.3 million. RSL is already the UK Ministry of Defence's (MoD) prime contractor for the SIFF programme. This should see the Dominie T Mk I in service up to 2015.

VIP TRANSPORT VERSIONS

RAF interest also fell on the HS.125 to fulfil its VIP transport squadron based at Northolt. No.32 Squadron received its first HS.125 CC Mk I on 20 April 1971, the first of four aircraft on order (XW788-791). Based on the HS.125 Series 400, these four aircraft were eventually sold off in 1994, ending up in the US (N255TS, N264TS, N266TS, N268TS respectively). This fleet was augmented by the acquisition of three other aircraft (XX505-507) and a number of CC.Is were eventually re-engined with Garrett TFE-731 turbofans, first introduced on the HS.127 Series 700. Some references show these aircraft with the designation CC Mk IA; this was, however, never officially taken up.

Next in line was the CC Mk 2, based on the HS.125 Series 600. After acquiring an initial batch of two aircraft (XX507, 508), the RAF operated a further four examples (ZA117-ZA120). The first pair were delivered towards the end of April 1973 and differed from the CC.Is in having a fuselage extended by two feet (61cm), a revised nose (including the elimination of the bubble cabin hood) and enlarged vertical tail surfaces above the tailplane. Range was increased by the introduction of a 227-litre fuel tank in the dorsal fin fairing. Originally powered by a pair of Rolls Royce Viper 621 turbojets, some CC Mk 2s were also converted to turbofan power.

The final transport version, known as the CC Mk 3, was based on the Series 700 version of the HS.125 that appeared from the outset powered by a pair of TFE-31-3 turbofans. Apart from the engines it was externally identical to the Series 600, and practically indistinguishable from the re-engined CC Mk 2s. Six CC Mk 3s were ordered for use by No.32 Squadron (ZD620, ZD621, ZD703, ZD704, ZE395, ZE396), with deliveries being effected between November 1982 and February 1984.

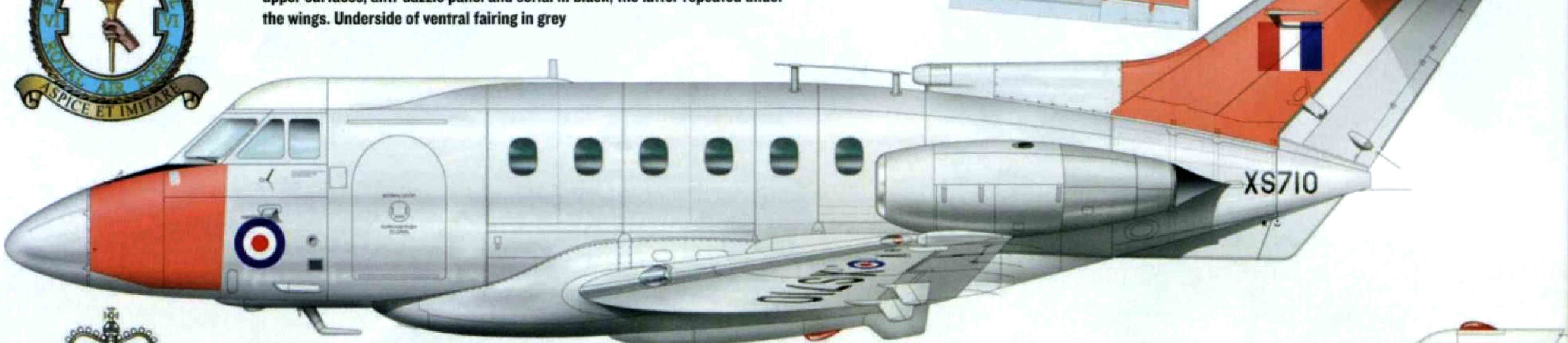
OTHER HS.125S

A 600B Series example serialled ZF130 was obtained by the MoD (Procurement Executive) to operate as a Sea Harrier avionics and systems development platform, operating at the BAe Dunsfold assembly line. This aircraft had already flown as HZ-DAC, HZ-SJP and G-BLUW.

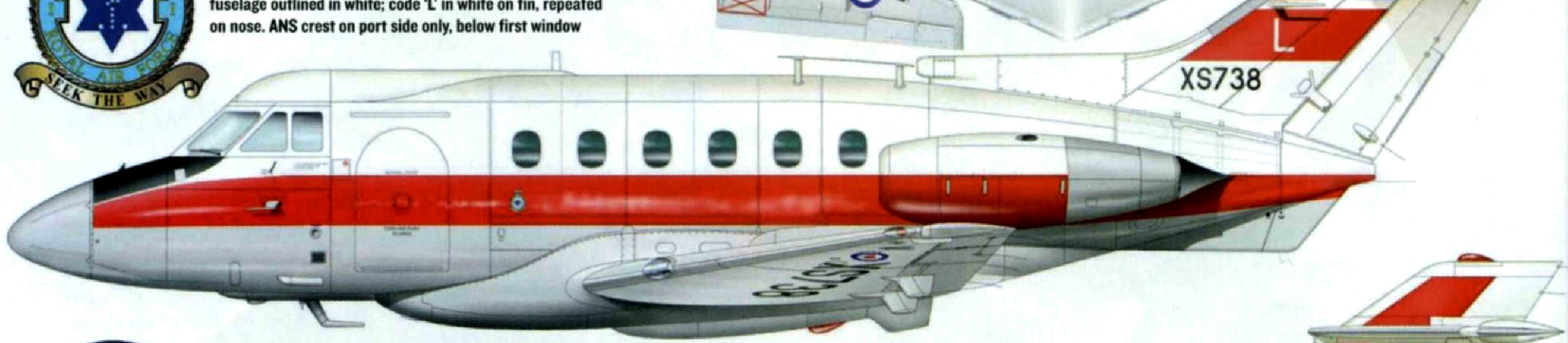
Probably the most colourful HS.125 to be operated by the RAF was XW930. Bearing construction number 25009, this HS.125 Series 1B (previously registered G-ATPC) was assigned to the Royal Aircraft Establishment (RAE), Bedford. During its period of service this aircraft was seen in various guises, fitted with all sorts of electronic and experimental equipment. It was also interesting for a number of changes in its livery. XW930 ended its days on the scrapheap at Portsmouth in June 1997. ■

ACKNOWLEDGEMENTS:
For their assistance in providing information and photographs: David Fleming, Tim McLelland, Stephen J. Muscat, David Spiteri Staines, MoD/ RAF Cranwell

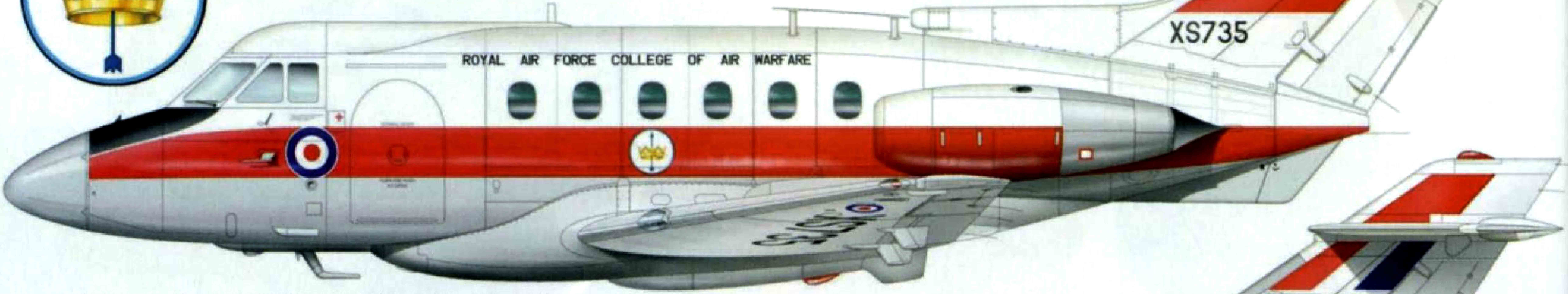
B.Ae 125 Series 2/Dominie T.1, XS710 (second production aircraft), 1965. Aluminium paint overall with tarnished natural metal leading edges; white cabin roof. Dayglo Orange nose band, fin area and outer sections of wing upper surfaces; anti-dazzle panel and serial in black, the latter repeated under the wings. Underside of ventral fairing in grey



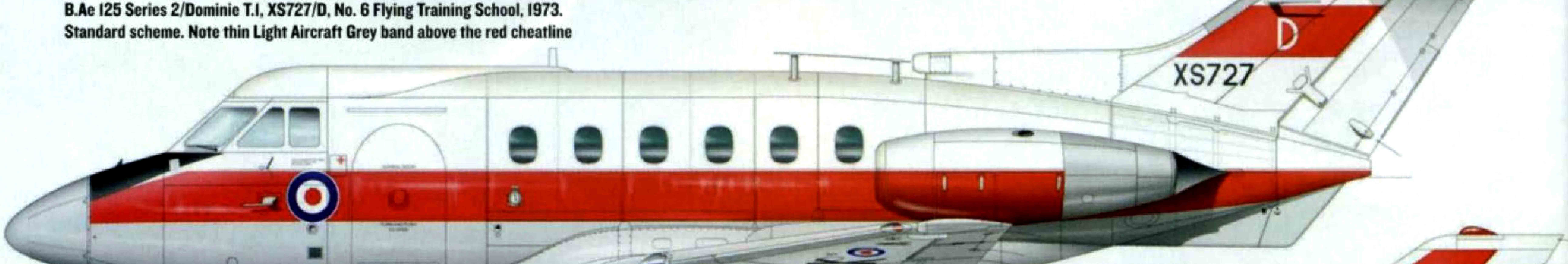
B.Ae 125 Series 2/Dominie T.1, XS738/L, No. 1 Air Navigation School, 1967. Light Aircraft Grey undersides and wings with Gloss white fuselage top and vertical tail surfaces; Signal Red cheatline and patches on fin. Natural metal flying leading edges and control surfaces. Roundels in six positions, those on fuselage outlined in white; code 'L' in white on fin, repeated on nose. ANS crest on port side only, below first window

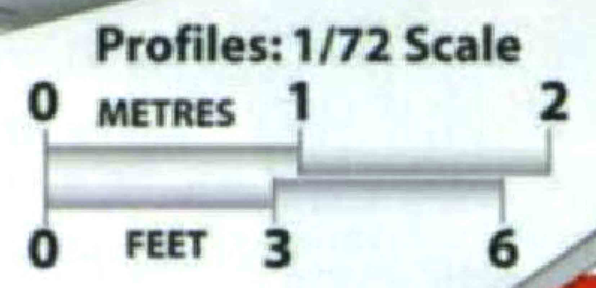


B.Ae 125 Series 2/Dominie T.1, XS735, Royal Air College of Air Warfare, 1968. Standard scheme; CAW crest below third window

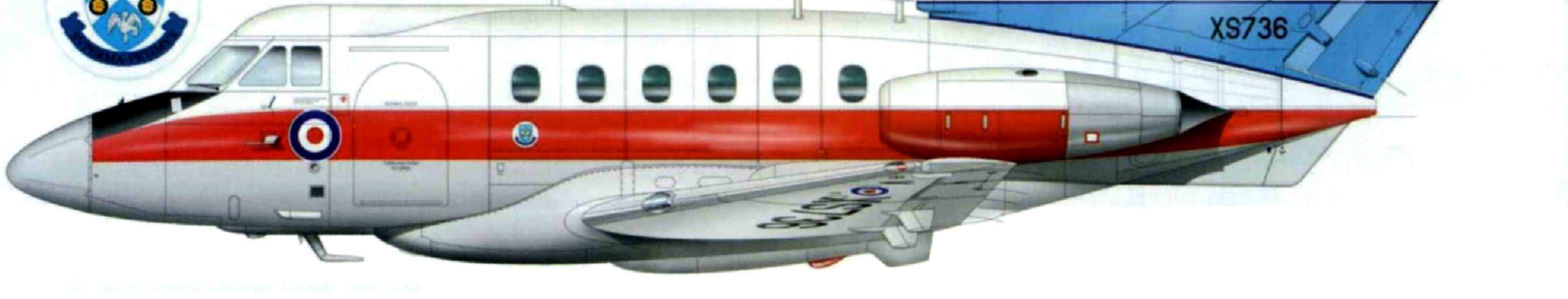


B.Ae 125 Series 2/Dominie T.1, XS727/D, No. 6 Flying Training School, 1973. Standard scheme. Note thin Light Aircraft Grey band above the red cheatline





B.Ae 125 Series 2/Dominie T.1, XS736, Royal Air Force College, Cranwell, 1974. Standard scheme with Arctic Blue lower section of fin, outlined in Roundel Blue; RAF College crest below first window, both sides. Note thin Light Aircraft Grey band above the red cheatline



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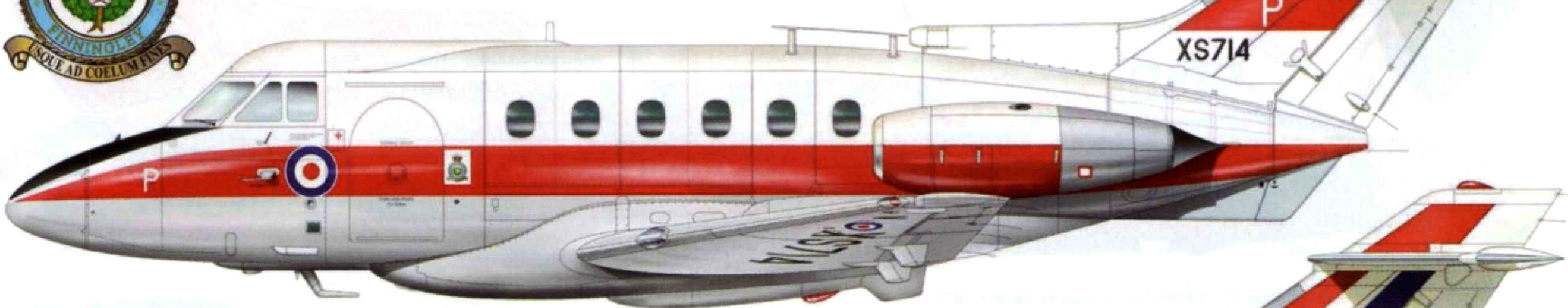
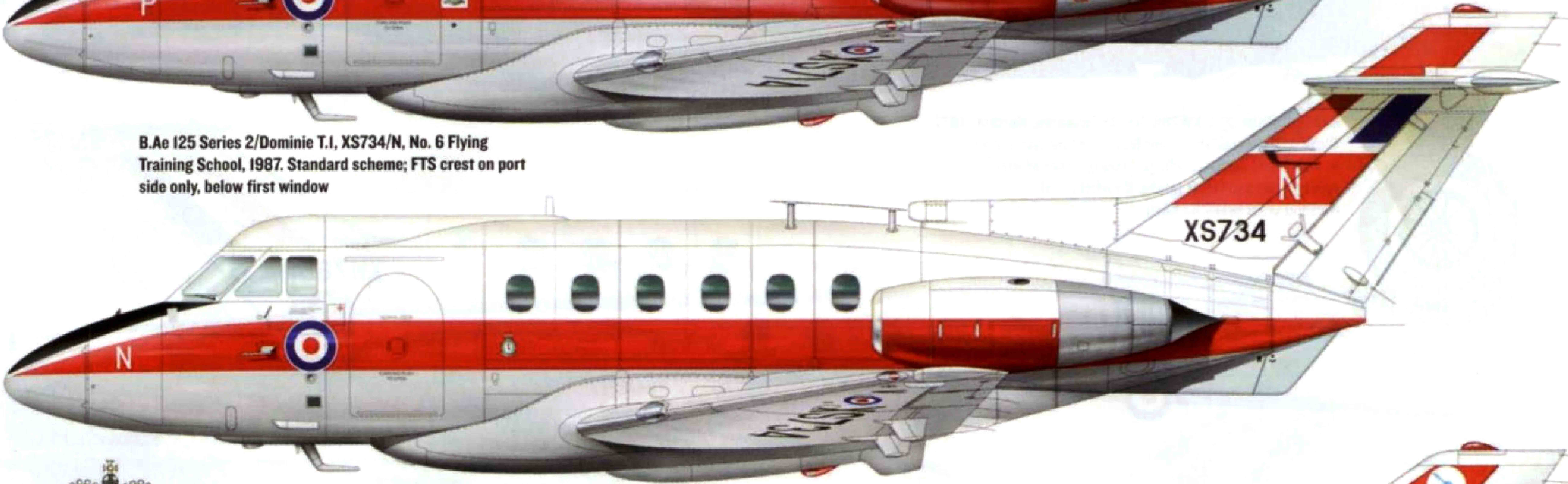
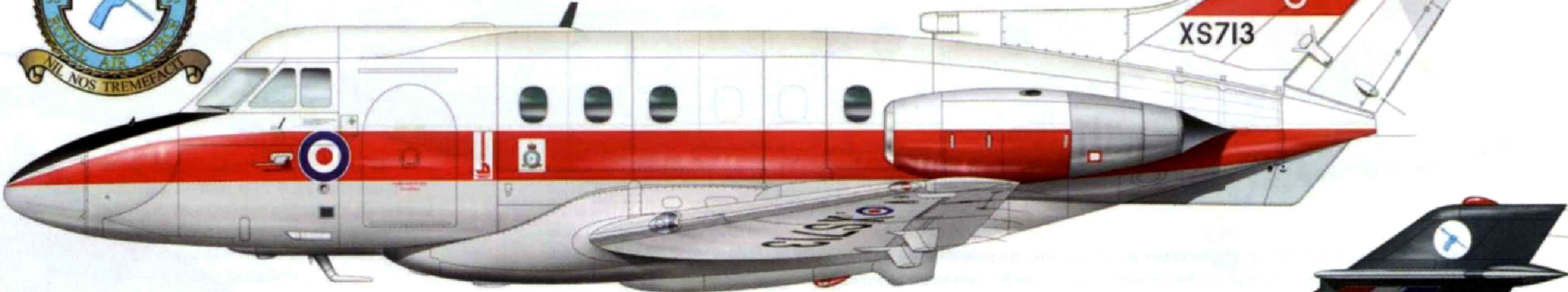
B.Ae 125 Series 2/Dominie T.I, XS714/P, No. 6 FTS, Finningley, 1986. Standard finish; RAF Finningley crest on port side only aft of the main access door



B.Ae 125 Series 2/Dominie T.I, XS734/N, No. 6 Flying Training School, 1987. Standard scheme; FTS crest on port side only, below first window

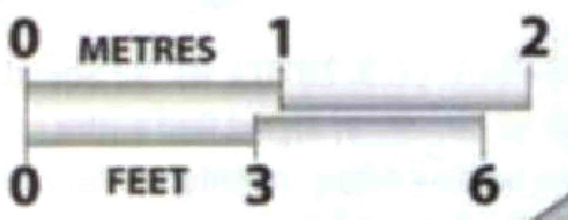


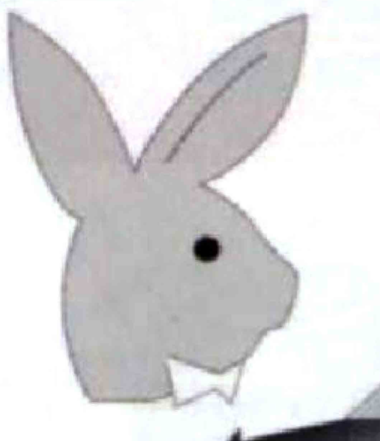
B.Ae 125 Series 2/Dominie T.I, XS713/C, 3FTS/55 (Reserve) Squadron. Standard scheme; 55 Squadron crest on port side only, below first window, and on top of fin. Note extended nose section and windows four and five blanked over



BAe 125 Series 2, Dominie T.I, XS731/J, No. 55 (Reserve) Squadron. Gloss black overall with white fuselage top decking and top of wings; natural metal leading edge to all flying surfaces. Roundels in six positions, those on fuselage and below wings edged in white; white serial and codes. Squadron badge on top of fin (both sides) and crest below first window on port side only

Scale 1:48





BAe HS.125 Series 2, Dominie T.I, XS739/F, No. 3 FTS. Same finish as above. Note silver 'bunny' on fin, with a smaller version (facing forward) ahead of cabin access door

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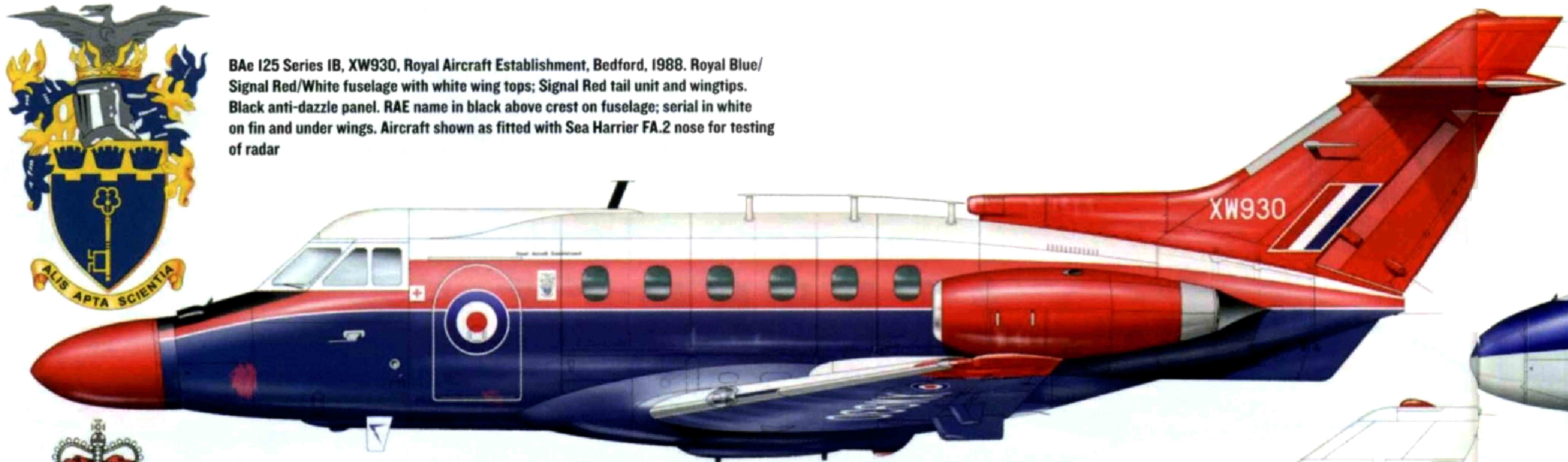
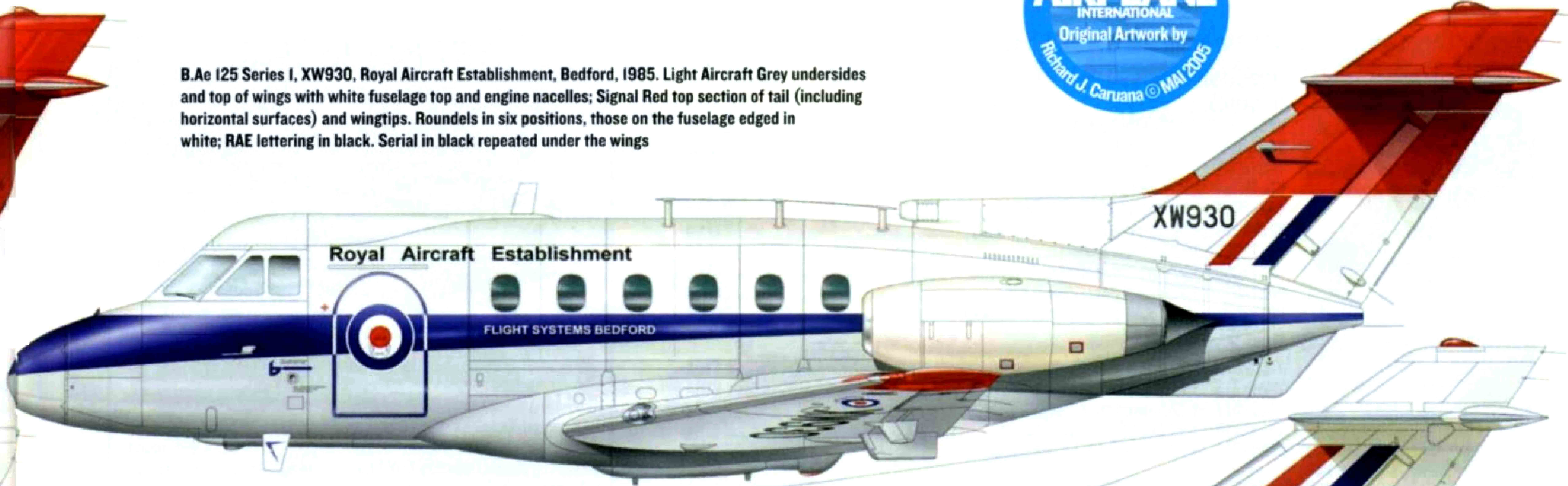
ALIS APTA SCIENTIA

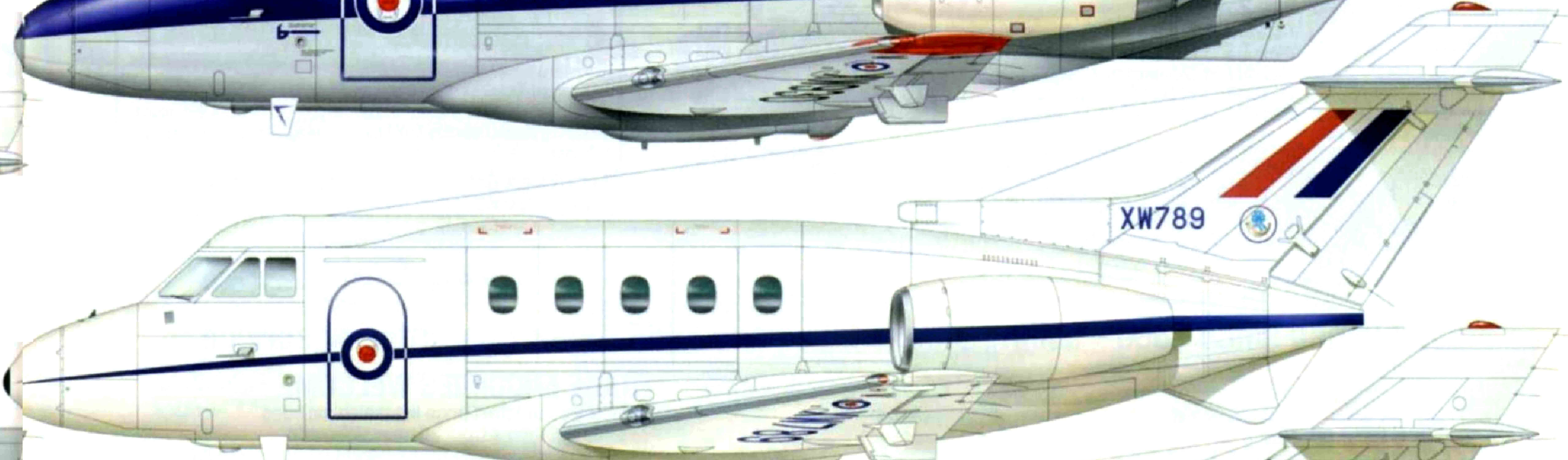
BAe 125 Series 1B, XW930, Royal Aircraft Establishment, Bedford, 1988. Royal Blue/Signal Red/White fuselage with white wing tops; Signal Red tail unit and wingtips. Black anti-dazzle panel. RAE name in black above crest on fuselage; serial in white on fin and under wings. Aircraft shown as fitted with Sea Harrier FA.2 nose for testing of radar



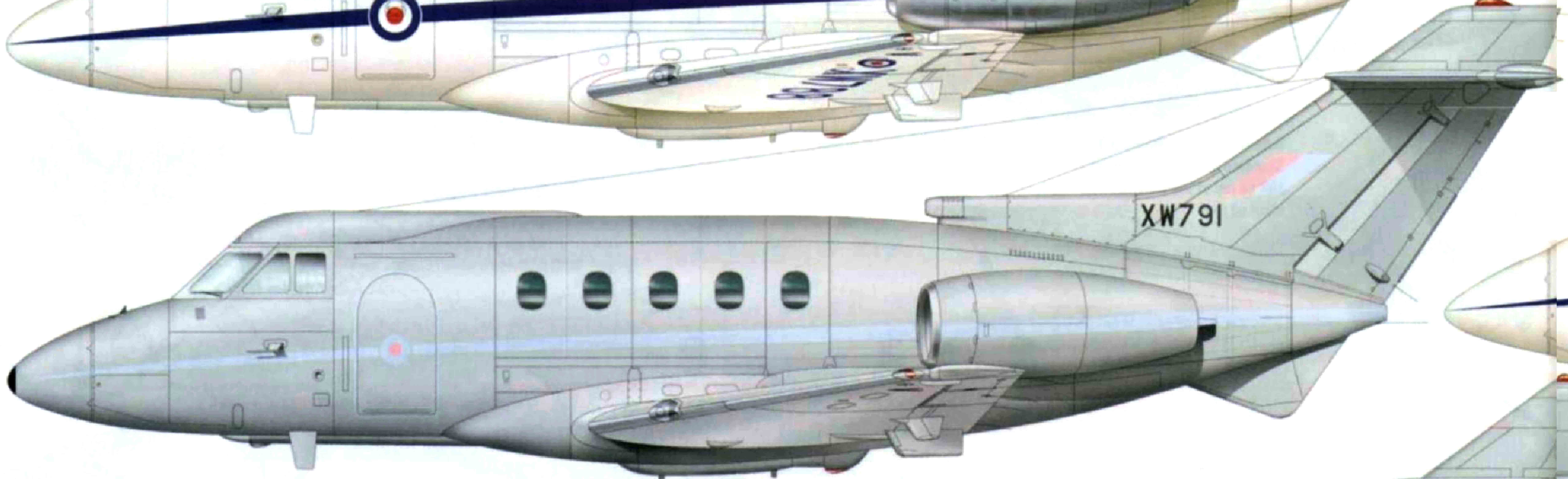
B.Ae 125 Series 1, XW930, Royal Aircraft Establishment, Bedford, 1985. Light Aircraft Grey undersides and top of wings with white fuselage top and engine nacelles; Signal Red top section of tail (including horizontal surfaces) and wingtips. Roundels in six positions, those on the fuselage edged in white; RAE lettering in black. Serial in black repeated under the wings



BAe 125-400B/CC.1, XW788, No. 32 Squadron, Northolt, 1977. Gloss white overall with Ident Blue cheatline and serial; natural metal engine cowlings, leading edges of wings, tailplane, fin and fin air intake. Roundels in six positions; RAF Northolt crest below fin flash

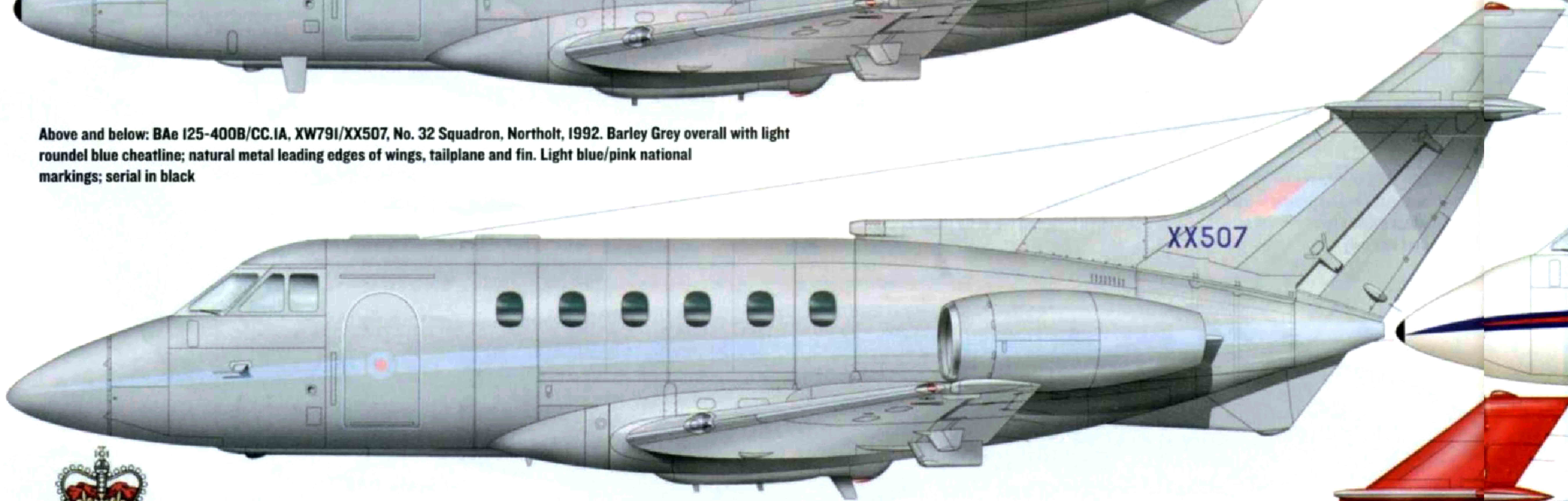


Above: BAe 125-400B/CC.1, XW789, No. 32 Squadron, Northolt, 1988. Gloss white overall with Ident Blue cheatline and serial; natural metal engine cowlings, leading edges of wings, tailplane, fin and fin air intake. Roundels in six positions. Unit crest on fin

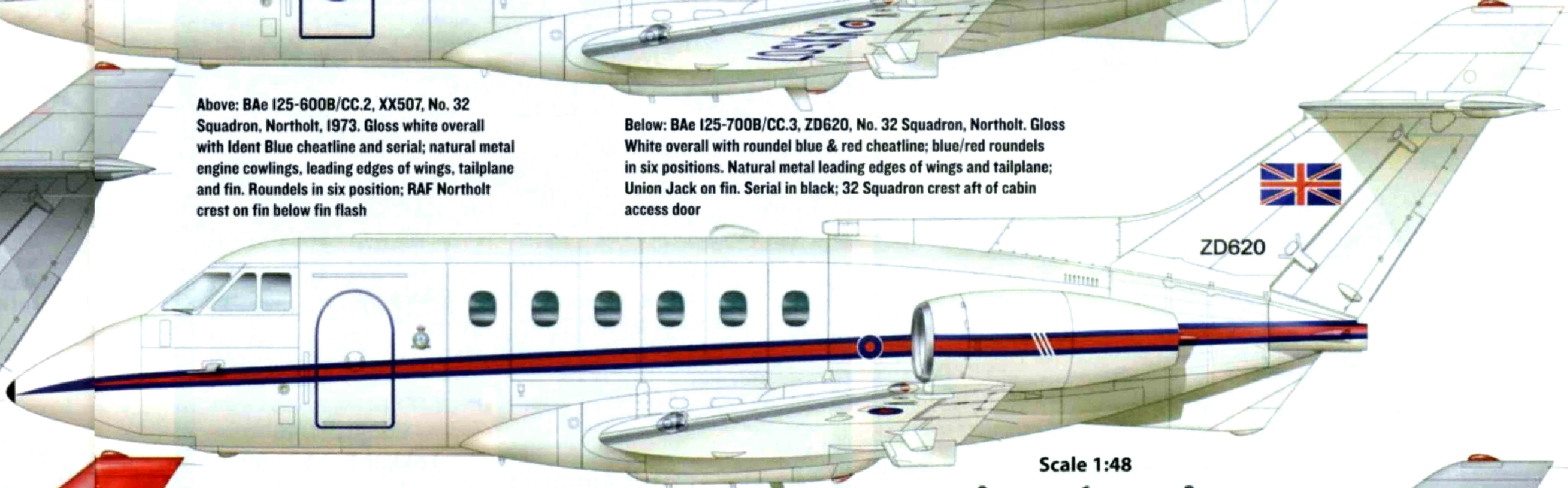


Above: BAe 125-600B/CC.2, XX507, No. 32 Squadron, Northolt, 1973. Gloss white overall with Ident Blue cheatline and serial; natural metal engine cowlings, leading edges of wings, tailplane and fin. Roundels in six position; RAF Northolt crest on fin below fin flash

Above and below: BAe 125-400B/CC.1A, XW791/XX507, No. 32 Squadron, Northolt, 1992. Barley Grey overall with light roundel blue cheatline; natural metal leading edges of wings, tailplane and fin. Light blue/pink national markings; serial in black



Below: BAe 125-700B/CC.3, ZD620, No. 32 Squadron, Northolt. Gloss White overall with roundel blue & red cheatline; blue/red roundels in six positions. Natural metal leading edges of wings and tailplane; Union Jack on fin. Serial in black; 32 Squadron crest aft of cabin access door



Scale 1:48
0 METRES 1 2
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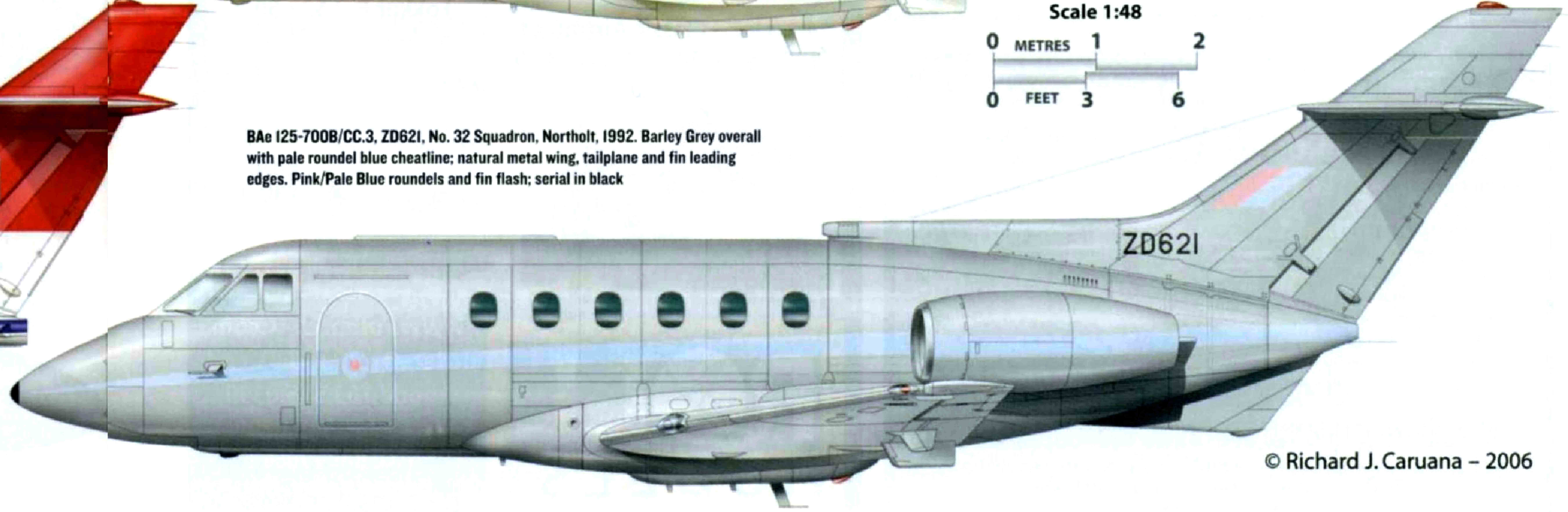
ADESTE COMITES

BAe 125-700B/CC.3, ZD703, No. 32 Squadron, Northolt, 2003. Gloss white overall with Insignia Blue/Silver cheatline; Signal Red entire upper tail unit and wings. Natural metal wing and tailplane leading edges; roundels in four wing positions. Union Jack, outlined in white, on fin; serial in black. No. 32 Squadron crest aft of cabin access door

BAe 125-700B/CC.3, ZD621, No. 32 Squadron, Northolt, 1992. Barley Grey overall with pale roundel blue cheatline; natural metal wing, tailplane and fin leading edges. Pink/Pale Blue roundels and fin flash; serial in black



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An Appreciation

PIERRE CLOSTERMANN, DSO, DFC

Pierre Clostermann was born at Curitiba, Brazil, on 28 February 1921 where his father worked as a French diplomat. He acquired his pilot's licence in November 1937 and followed his education in Paris by studying engineering in the USA, at the time when France fell under German occupation.

In 1941 he joined the Free French Forces (No.341 'Alsace' Squadron) and the following year was transferred to No.602 Squadron RAF where he flew Spitfires. This was the beginning of his brilliant career as a pilot and fighter ace, destroying at least 11 enemy aircraft, two probables and seven credited as damaged.

On 4 March 1945 he joined No.274 Squadron and converted onto the Hawker Tempest, opening his score on this aircraft the following day by shooting down a Bf 109 whilst flying EJ893 (JJ•W). In the middle of March 1945 he was transferred to No.56 Squadron with the rank of Flight Commander and on 8 April he joined No.3 Squadron as 'A' Flight Commander. On 20 April he shot down a pair of Fw 190D-9s. His biggest haul in one day came on 3 May when he shot down another Fw 190D, a Ju 252, two Do 24s and shared two Bf 109 victories. Clostermann's final score on the Tempest is at least 12 destroyed, six shared and two probables. He was awarded the DSO and DFC and Bar, in addition to the French, Beglian and American decorations.

After the war Clostermann went into politics and business, serving as a Deputy in the French Parliament and as an aeronautics executive for Cessna and Dassault. He also participated briefly in operations in the Algerian War of the early 1960s. Among the number of books he wrote, he is best known for 'The Big Show' which has sold over three million copies and is recommended reading to any aviation enthusiast.

Pierre Clostermann passed away on 24 March 2006 at his home at Montesquieu-des-Albères. ■

Acknowledgements: My sincere thanks to Christer Landberg for allowing me to use information from his excellent Hawker Tempest web-page: http://www.hawkertempest.se/index.htm. Thanks also to Phil Poffenbarger for allowing us the use of the personalized autographed photo presented to him by Pierre Clostermann

Spitfire LF Mk IXc, MH526/LO•D, flown by Pierre Clostermann of No. 602 Squadron, in which he was the first French combat pilot to land in liberated territory in Normandy

Hawker Tempest Mk V, NV724/JF•E, flown by Flt Lt Pierre Clostermann, No.3 Squadron RAF, Kastrup (Denmark), 1945

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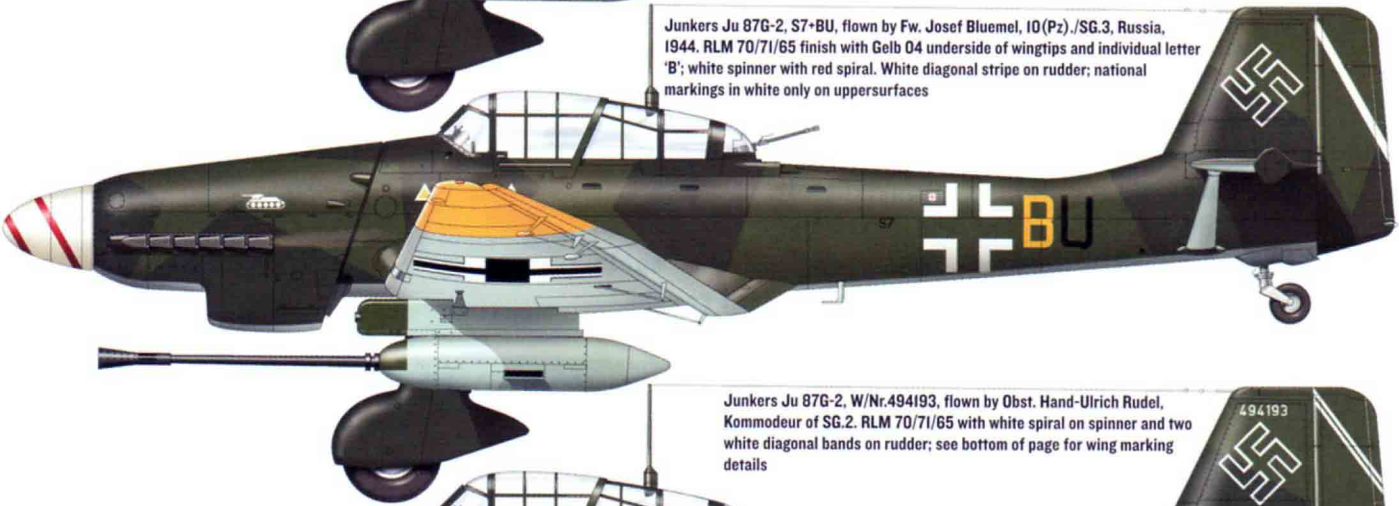
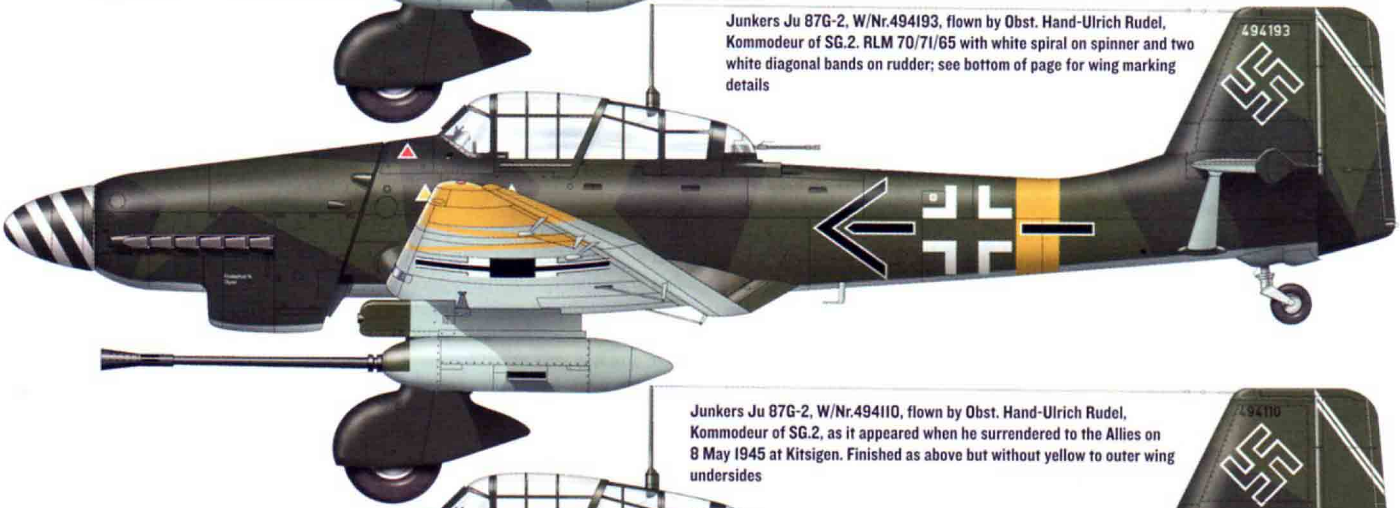
Junkers Ju 87G-2, W/Nr.494221, T6+NU, 10./SG.2. RLM 70/71/65 finish with white spinner front and black spiral; black codes with white 'N'. White only national markings on upper surfaces; two white bands on rudder

Junkers Ju 87G-2, W/Nr.484231, S7+EN, 10(Pz)./SG.3 , September 1944. RLM 7/71/65 finish with Gelb 04 underside of wingtips; white spinner with red spiral. Codes and serial in white. Force landed near Kekava (Latvia) after being hit by Soviet ground fire

Junkers Ju 87G-2, S7+BU, flown by Fw. Josef Bluemel, 10(Pz)./SG.3, Russia, 1944. RLM 70/71/65 finish with Gelb 04 underside of wingtips and individual letter 'B'; white spinner with red spiral. White diagonal stripe on rudder; national markings in white only on uppersurfaces



Junkers Ju 87G-2, W/Nr.494193, flown by Obst. Hand-Ulrich Rudel, Kommodeur of SG.2. RLM 70/71/65 with white spiral on spinner and two white diagonal bands on rudder; see bottom of page for wing marking details



Junkers Ju 87G-2, W/Nr.494110, flown by Obst. Hand-Ulrich Rudel, Kommodeur of SG.2, as it appeared when he surrendered to the Allies on 8 May 1945 at Kitsigen. Finished as above but without yellow to outer wing undersides

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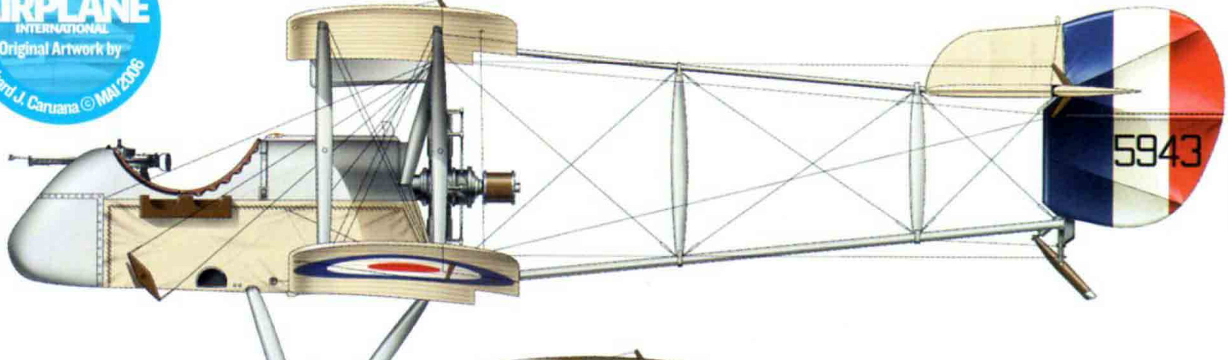
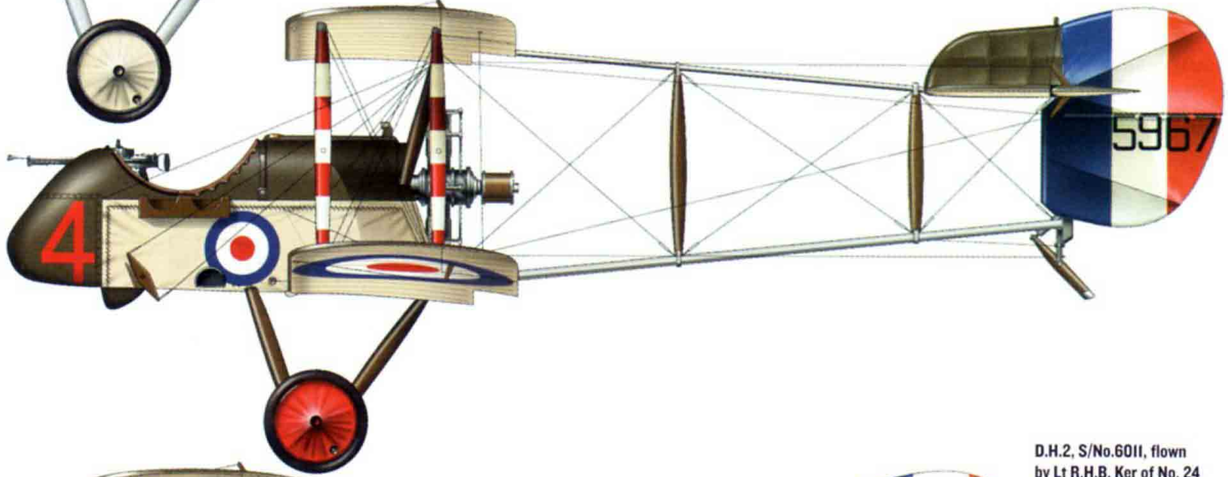
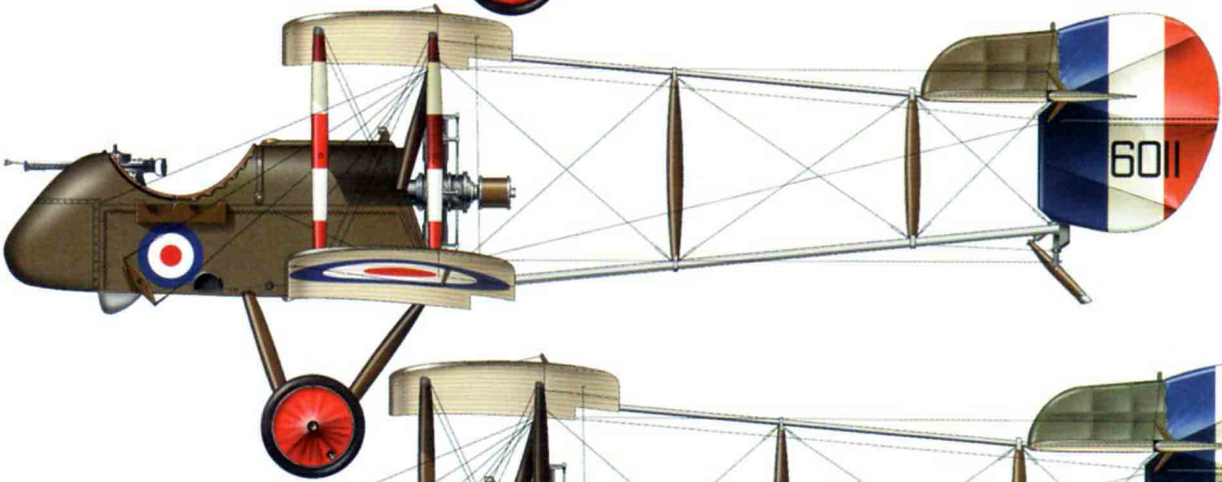
Model AIRPLANE INTERNATIONAL
Original Artwork by
Richard J. Caruana © MAI 2006



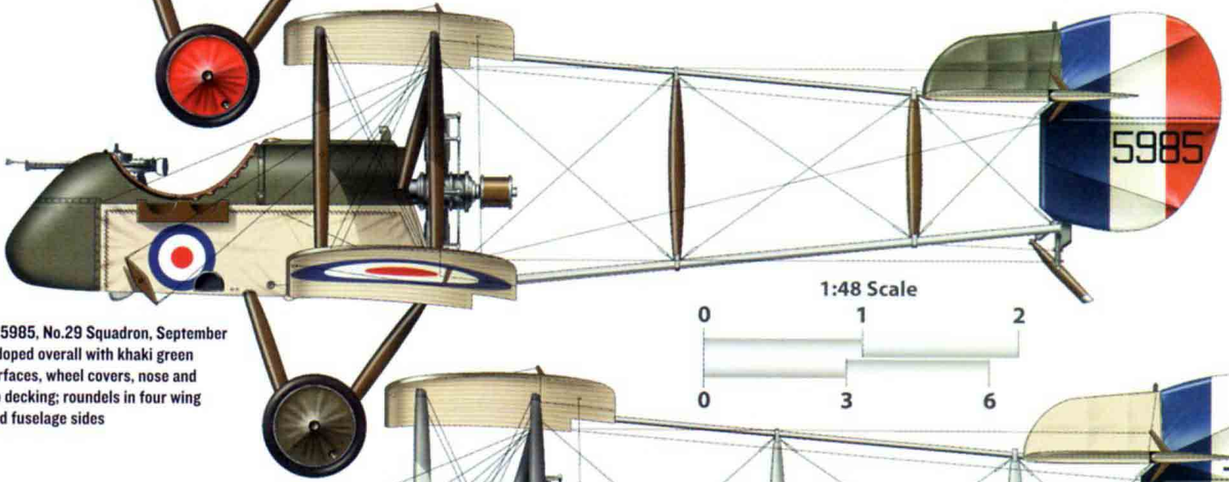
D.H.2, S/No.5943 (an early production aircraft). Metal nose and fuselage top decking panels; all the rest is clear doped. Roundels in four wing positions; note gravity fuel tank below top port wing



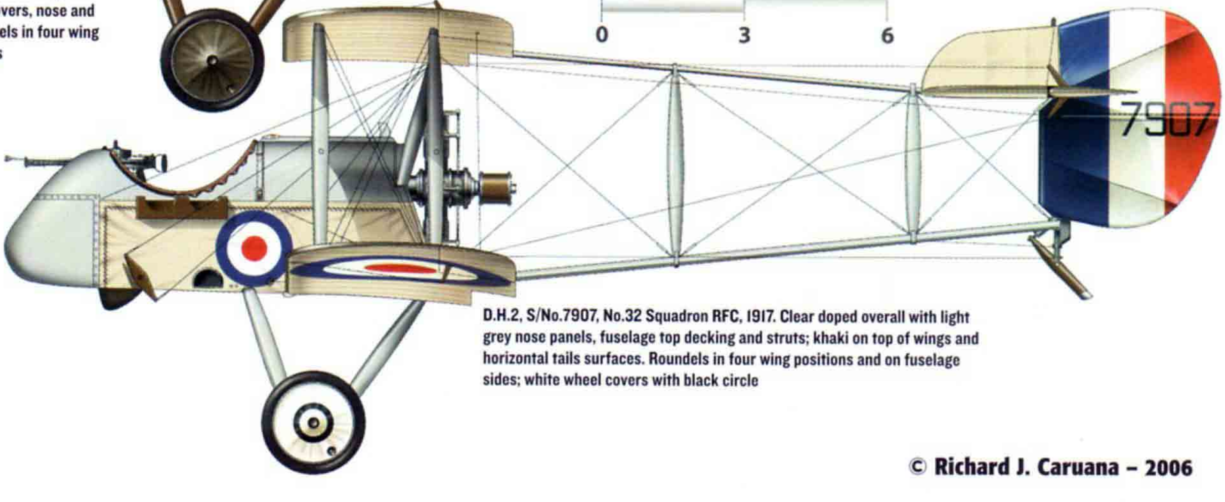
D.H.2, S/No.5967, No.24 Squadron, 1916. Clear doped overall with khaki front and upper fuselage panels; red wheel covers and '4' on nose. Red/white striped interplane struts; roundels in four wing positions and fuselage sides



D.H.2, S/No.6011, flown by Lt R.H.B. Ker of No. 24 Squadron RFC, July 1916. Clear doped overall with khahi uppersurfaces and fuselage top and sides; red/white interplane struts. Red wheel covers; roundels in four wing positions and fuselage sides



D.H.2, S/No.5985, No.29 Squadron, September 1916. Clear doped overall with khaki green on upper surfaces, wheel covers, nose and fuselage top decking; roundels in four wing positions and fuselage sides



D.H.2, S/No.7907, No.32 Squadron RFC, 1917. Clear doped overall with light grey nose panels, fuselage top decking and struts; khaki on top of wings and horizontal tails surfaces. Roundels in four wing positions and on fuselage sides; white wheel covers with black circle

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THE HAWKER SEA FURY

Though conceived during the final stages of the Second World War, the Sea Fury – like its stable-mate the Tempest – arrived too late to take an active part in the conflict. This second thoroughbred from the Hawker stable to carry the name 'Fury' was to mark the epitome of an era. While the first Fury marked the height of perfection in biplane fighters, the Sea Fury brought to an end the long line of piston-engined fighters in brilliant style.

BY RICHARD J. CARUANA

The Royal Navy (RN) had fought that war mostly on 'borrowed' equipment, finding itself at a distinct disadvantage over its counterpart across the Atlantic. This situation presented itself most dramatically especially when it was committed to a Pacific war in defence of the British Empire's outposts in that region. Japan's fighter force proved to be far superior to the 'poor copies' that many were made to believe before the war, as the United States Navy (USN) learnt at a high cost. Sea Hurricanes and Seafires were certainly no match to the light and highly manoeuvrable Japanese aircraft. Not all American equipment, which for a certain period formed an important part of the RN's inventory, could counter the threat.

Turning to the British aircraft industry, the Admiralty found that the only possible contender would be a lightened version of the Tempest, then undergoing a troubled stage in its development due to a series of teething problems with its Centaurus engine. Moreover, the RN was convinced that a 'common' fighter design for the Royal Air Force (RAF) and Navy to be used in the Pacific Theatre would certainly presented a number of advantages; commonality of spares, servicing equipment and trained technicians would have certainly eased operational pressures in an area so far away from home.

Thus, Sydney Camm proposed a Centaurus XII-powered aircraft based on the Tempest II, which would cover the needs of both services. Design details were listed in Specifications F.2/43 and N.7/43 issued in January and February 1943 respectively (the 'F' specification referring to the RAF version while the 'N' refers to the RN's). Within a short period of time, the programme began to assume gigantic proportions, with the planning of heavy mass production of the new fighters, which also involved Boulton-Paul in the construction and/or modification to naval standard of considerable numbers of aircraft.

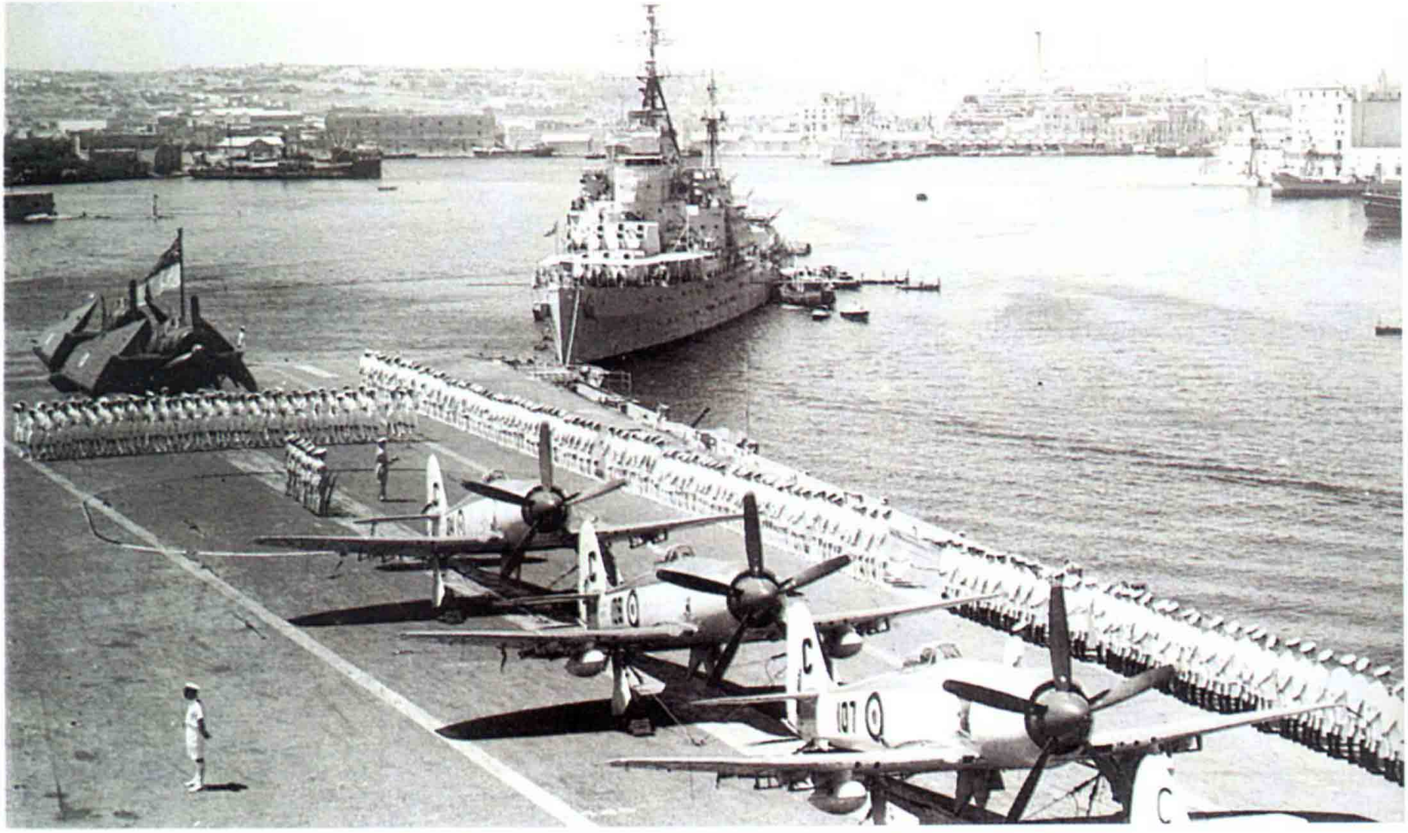
Six prototypes were ordered in June 1943 to be built in three pairs, each pair powered by a Centaurus XII, Centaurus XXII and the Rolls Royce Griffon (the latter as a backup in case the Centaurus programme failed). The naval specification was revised close to the end of that year and re-issued as N.22/43 to include full naval equipment.

DEVELOPMENT

Immediately P. Lucas flew the prototype for the first time on 1 September 1944 by, it became evident that this was not going to be an easy beast to tame. Problems with the Centaurus engine persisted and the RAF standard prototype (NX798) suffered a wheels-up landing later in the year due to engine failure. Next to take to the air was LA610 on 27 November, this being the Griffon-engined version. Though it was to become one of the fastest piston-powered aircraft in British aviation history (re-engined with the Napier Sabre VII), its maintenance was considered to be too complicated for service use.

By that time it was also becoming very clear that the war in Europe would be over in a matter of months; in the Pacific, US forces had also started to reverse the fortunes of war, as it committed men and machines in ever greater numbers to that theatre. Another important aspect that both the military and aviation industry had to consider was the advent of the jet turbine engine; little doubt was left that this revolutionary means of propulsion was where future development lied. Hawker's project, therefore suffered a severe cutback of orders. All 200 examples that had just been ordered by the RAF were cancelled, while the RN was only allowed to retain half that number.

The first 'true' Sea Fury (SR661) performed its maiden flight on 21 February 1945. Though fitted with an arrestor hook, it lacked folding wings; Centaurus



HMS Centaur at Malta's Grand Harbour on Friday, 6 August, 1954. Sea Furies are ranged on the flight line with a bair of Avengers at the end of the deck. HMS Gambia astern

The ill-fated TF956, carrying full Korean markings, returning from a display at Greenham Common International Air Tatoo, July 1973

stoppages in the air (and even on the ground during the take-off run) continued to do the test programme. Victory in Europe (VE) Day came and passed before the second naval prototype (SR666) took to the air on 12 October of the same year. This aircraft was powered by a Centaurus XV driving a five-bladed Rotol propeller and carried full naval equipment. The following year it was this second prototype that was used for a series of tests on board HMS Victorious during which crews on board the carrier witnessed some hair-raising episodes!

By that time, the third prototype (VB857) had been built fitted with a Centaurus XXII, the engine that finally cured all problems encountered by all the previous versions and was to become a well-loved and reliable engine. Just before production went into full swing, Hawker built an experimental Fury, powered by the Sabre VII. Carrying serial VP207, this aircraft was aimed at a possible post-war export marked, which however did not materialise.

Better luck greeted NX802, which was in fact one of the RAF's prototypes powered by the Centaurus XVIII. When the RAF order was cancelled, Hawkers bought back this prototype to be used as a development hack until it was eventually sold to Pakistan (as described further on).

SERVICE USE

Notwithstanding post-war economies, the original order for 100 examples for the RN was considerably increased. This was mainly due to the fact that a real navy jet fighter had still not materialised, while another war was looming on the horizon. By the time a conflict erupted in Korea, orders for the Sea Fury had reached the 570 mark for the RN alone, while a further 100 examples were on order for Australia and Canada.

Peter A Taylor of No. 1833 NAS emerges from his Sea Fury FB.II, on return from live rocket firing to Hal Far, September 1954

Service Clearance Trials were successfully completed in July 1947 and deliveries of the new fighter started in August of that year, as No.807 Naval Air Squadron (NAS) replaced its Seafires XVIIs with the initial production model designated Sea Fury F Mk X. Other deliveries followed, to Nos.778, 802, 803 and 805 NAS. This massive dose of powerful equipment did not, however, relegate the Seafire, which, as the FR Mk 47 was a veritable match to the Sea Fury. So much so, that the latter's role was changed from that of fighter to ground attack, receiving the designation FB Mk II.

The new version began to equip British naval units in May 1948, starting with No.802 NAS at Eglington. Deliveries continued initially to shore stations, including Lee-on-Solent, Gosport, Culham, Culdrose, Abbotsinch, Donibristle, Anthorn and Streeton. The FB Mk II was to see extensive service with Nos.801, 803, 804, 805, 807 and 808 NAS, as names like HMS Ocean, Glory and Theseus became their homes for many months while at sea. These were known as the 1st, 17th and 21st Carrier Air Groups (CAG).

First unit to see action in Korea was No.807 NAS embarked on HMS Theseus in October 1950, from where the Sea Furies performed their designated duties most efficiently in the ground attack role over the following six months. No.802 NAS embarked on HMS Ocean and Nos.801 and 804 NAS on HMS Glory where next to arrive in the combat zone while Nos.805 and 808 Squadrons flew from the Australian carrier HMAS Sydney. No.802 squadron also chalked up the first victory over an enemy jet, when a Sea Fury piloted by Lt P. Carmichael shot down a MiG-15 on 9 August 1950, becoming the first naval pilot to earn such a credit. Back in the United Kingdom (UK) Sea Furies were also issued to squadrons of the Royal Navy Volunteer Reserve (RNVR), namely Nos.1831, 1833, 1834, 1835 and 1836 NAS.

Sea Fury FB.IIs of No.1833 Squadron, based at Bramcote, flying off Malta, in May 1954

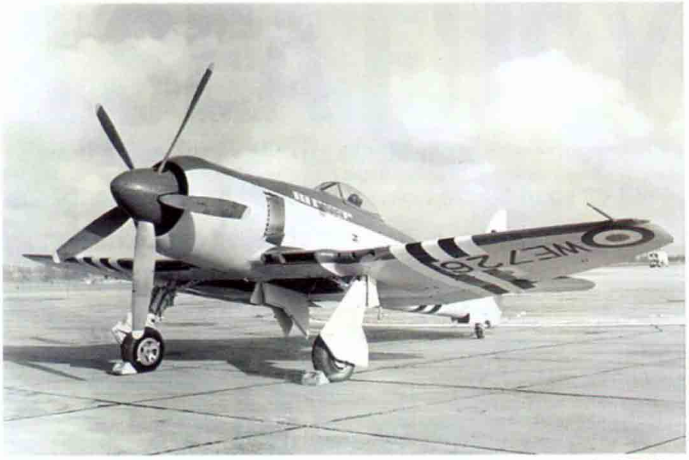
EXPORTS AND TWO-SEAT VERSIONS

Two of the Fleet Air Arm (FAA) squadrons quoted above were, in actual fact, Royal Australian Navy (RAN) units. Nos.805 and 808 Squadrons RAN had formed in the UK in August 1948 and April 1950 respectively, later to be joined by No.850 in January 1953. The latter was the first to be disbanded, on 3 August 1954 at Nowra, while No.808 disbanded on 5 October of that same year. No.805 continued to fly the Sea Fury until 25 March 1958. Among the secondary units to use the type in RAN service was Nos.723, 724 and 725 mainly in the training role, communications and fleet requirements.

Similarly, Royal Canadian Navy (RCN) units within the Fleet Air Arm operated Sea Furies. Of the squadrons mentioned above, No.803 received its FB.IIs in August 1947 and embarked on board HMCS Warrior together with No.824 Squadron flying Fairey Fireflies, participating in operations of 19th CAG. As from September 1948, No.883 Squadron operated Sea Furies, within 18th CAG although in November it was transferred to 19th CAG embarked on HMSC Magnificent. No.883 was renumbered on 1 May 1951 as No.871, still equipped with ten Sea Fury FB.IIs and fell within 30th CAG, but not for long as in November of the following year it became VF-871 (when the RCN adopted American-style numbering for its units) and replaced the piston-engined fighters with McDonnell F2H-3 Banshees.

The first export success, however, came from the Netherlands, when Hawkers received an order for 22 Sea Fury FB.50s on 21 October 1946 as a result on the company's intensive sales campaign. The type was so

Known as the 'Baghdad Fury, the Iraqi examples were de-navalised versions of the Sea Fury (Hawker Aircraft Ltd)



WJ231 now on static display at the Fleet Air Arm Museum, Yeovilton, was for a time painted as WE726 from HMS Ocean

"No.802 Squadron also chalked up the first victory over an enemy jet, when a Sea Fury piloted by Lt P. Carmichael shot down a MiG-15 on the 9th August 1950, becoming the first naval pilot to earn such a credit"

well-received by the Dutch Navy (Kon. Marine) that a further 25 examples were built under licence by Fokker between 1951 and 1952. After a working up period on the type at the Fighter Pilot Combat School at Valkenburg, No.860 Squadron was formed on 15 July 1950. This unit continued its training period on board British carriers, namely HMS Indomitable and HMS Illustrious over the next two years, unit it began to operate from the Dutch carrier HrMs Karle Doorman.

This was followed by export sales to Iraq for an order of 30 single-seat fighters and for two-seat trainers placed on 4 December 1946. It was at around this time that the RN too expressed interest in a two-seat trainer version of the Sea Fury. Iraq's request for such a trainer was probably spurred by the excellent reputation that Hawkers had gained with its two-seat dual-control Hurricane version built for Persia. Originally the T Mk 20, as the RN's version was designated, retained the front cockpit and had a second similar canopy added right behind it. Equipment usually fitted to the FB.II behind the pilot's seat was relocated to the wings, replacing the inboard pair of guns; the outboard pair of 20mm cannon was retained.

T Mk 20 prototype VX818, built from an airframe on order from Iraq, flew for the first time on 15 January 1948. Within the following couple of months the canopy arrangement was modified, the front and rear canopies being connected by a transparent 'tunnel'. This reduced considerably the instructor's field of vision from the rear cockpit; a periscope and mirror was therefore added above the central tunnel mounted on a pair of inverted 'V' struts. Following extensive tests at Boscombe Down, the prototype was transferred to the Empire Test Pilots School (ETPS), Farnborough, in March 1949. The Admiralty placed an order for 60 T.20, with the first production aircraft being delivered on 8 February 1950.

Back to the 'Baghdad' Fury, as the Iraqi version was usually referred to, did not feature any naval equipment such as folding wings and arrestor hook; in fact, the hook attachment fairing at the bottom of the rear fuselage was cleaned up and faired directly in line with the rudder. Delivery of this order was completed by March 1950, except for two of the two-seaters, one of which was retained by the Admiralty to become the prototype of the Sea Fury T.20 (as already described) while the other was sold to Pakistan. It is important to note that the Iraqi two-seaters retained the original, separate, canopies and were never modified to RN's standard.

Iraq requested a second batch of Furies (25 examples) on 21 July 1951 that, however, Hawkers could not meet due to its heavy production programme for the FAA. In May of the following year, the Admiralty relinquished ten FB.IIs from its own order to be passed on to Iraq, the balance being delivered during 1953. Finally, a request was also made for three ex-FAA T.20 two-seat trainers that were delivered with the final batch of single-seat fighters in 1953.

The other major export operator of the Fury was Pakistan initially with an order for 50 Mk.60s (L900-L949), delivered during 1950. Following the acquisition of one of the second prototype (NX802), a follow-up order was placed for 42 Fury Mk.60s and five T Mk 61 (the latter being the Pakistani designation for the two-seat trainer), all deliveries having been made by 1954.

Egypt received a total of 13 examples while Burma ordered 18, all coming from ex-FAA stocks. Cuba's Batista Government placed an order for 15 FB.IIs and a pair of T.20s in 1957 that were delivered at the time of Castro's revolution in 1958. During 1957 three ex-RN T.20s were acquired by Burma. Hawker rebuilt 15 ex-FAA T.20s for Deutsche Luftfahrt Beratungsdienst (DLB), a civilian operator performing target-towing duties for the Luftwaffe beginning in 1958. A single F Mk 50 was also acquired by DLB from the Netherlands in 1963. These scarlet-finished Furies continued to fly well into the 1970s, when they found willing civilian 'warbird' customers waiting to buy the surviving aircraft.

The FAAHF operated TF956 until it had to be abandoned off the coast of Scotland due to the failure of the undercarriage system. The flight manual said that on no account was a crash-landing with one oleo down to be attempted, so the pilot had no option but to bale out, as the leg would not retract

AND THEY STILL FLY

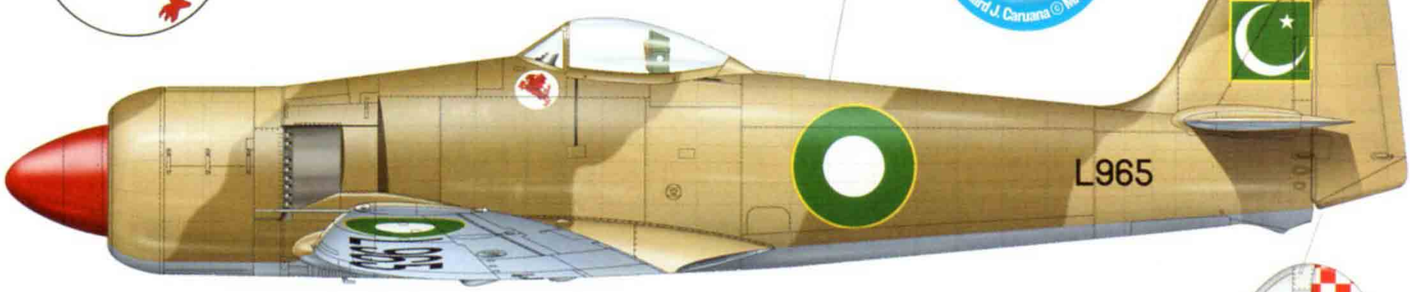
Single and two-seat Sea Furies survive in relatively larger numbers than contemporary propeller-driven fighters. No sooner had major operators began to retire the type from service that they were adapted, sometimes in highly modified forms, for air racing in the US. Others were painstakingly refurbished to perform in the airshow circuit.

Among the more popular Sea Furies seen at air displays is VR930, 110/O of the Fleet Air Arm's Historic Flight (FAAHF), which replaced the earlier TF956 that had for so many years thrilled crowds all over the UK. Unfortunately the latter was destroyed when the pilot, John Beattie, had to abandon the aircraft due to an undercarriage malfunction and it crashed into the sea off the Scottish coast. TF956 had been painted to represent a Sea Fur operating from HMS Theseus during the Korean War.

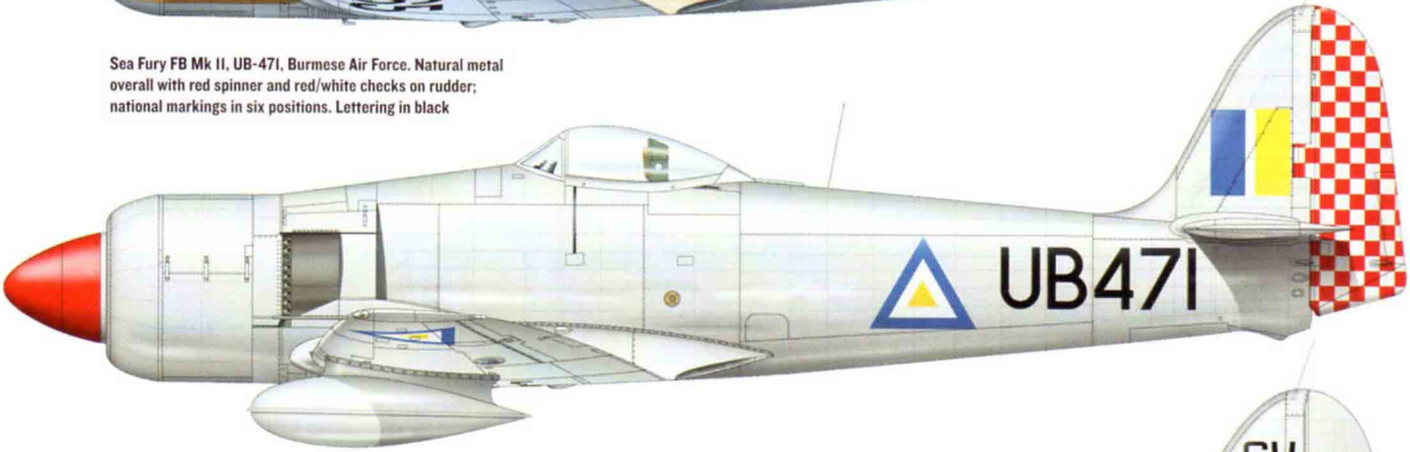
The Flight also operated a T.20, WG655/910/GN, which was written off in an accident on 14 July 1990. Remains from this aircraft went to complete WJ232 (ZK-SFR) which, being originally an Iraqi Fury, lacked folding wings and arrestor hook. The FAA Museum at Yeovilton houses another static exhibit, FB.II WJ231.

Those who have been lucky enough to see a Sea Fury in the air will confirm that it is a spirited performer, displaying its enormous power to full advantage whilst maintaining excellent handling qualities. It was, no doubt, the epitome of its genre, as witnessed by all those still flying at air races and air displays, which continue to bring to the front the aircraft's fighting spirit, still burning notwithstanding the passage of time. ■

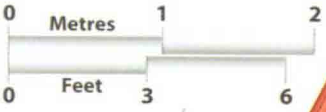
Sea Fury FB Mk 60, L965, No.9 Squadron, Pakistan Air Force. Dark Earth/Mid Stone upper surfaces with Azure Blue undersides; red spinner, black serials. National markings in six positions (outlined in yellow); unit crest below windscreen



Sea Fury FB Mk 11, UB-471, Burmese Air Force. Natural metal overall with red spinner and red/white checks on rudder; national markings in six positions. Lettering in black



Sea Fury T Mk 20, VX286, 294/CW, No.738 NAS, 1951. Silver overall with yellow bands around wings and rear fuselage; blue spinner. All lettering in black; roundels in six positions



Sea Fury TT Mk 20, D-CACU/ES3616, Deutsche Luftfahrt Beratungsdienst. Scarlet overall with all lettering in black; note fin flash bordered in white

Sea Fury T Mk 20, N924G/924, (ex-D-FAMI, D-CAMI, G-BCKH, N46690, N62147), Preserved in flying condition in the US (arrived October 1974), Dennis & Brian Sanders/Sanders Aircraft Technologies, California. Extra Dark Sea Grey upper surfaces with Sky underside; yellow spinner and bands around wings and fuselage. All lettering in black, with 'NAVY' repeated below the wings

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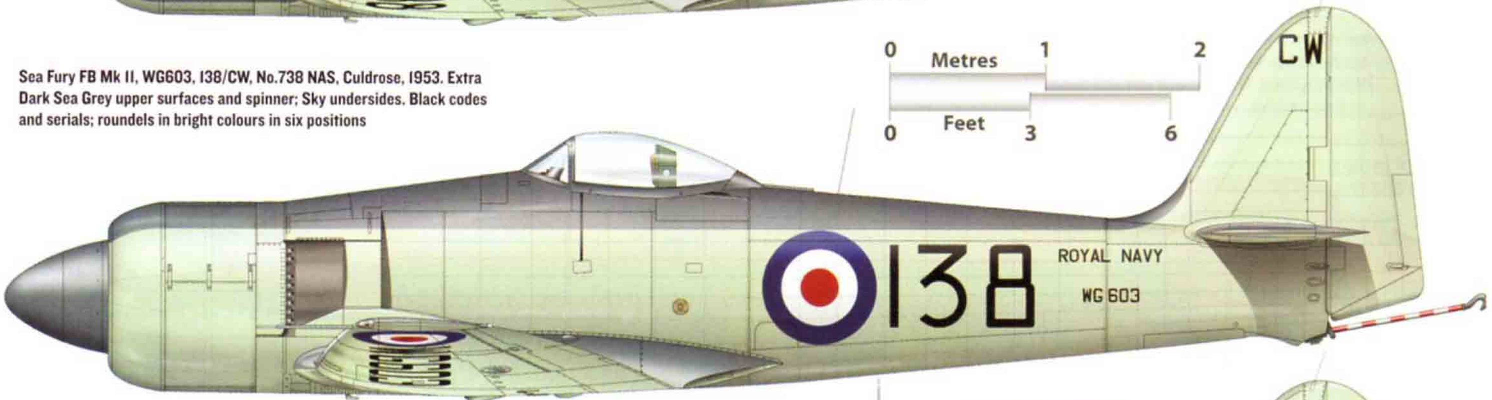
Sea Fury F Mk X, TF952, 106/JR, No.805 Squadron RAN, Eglinton, 1948. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. 'C' type roundels in four wing positions; spinners are believed to have been red

Sea Fury F Mk X, TF912, 120/VL, No.799 NAS, Yeovilton. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. Yellow spinner; 'C' type roundels in four wing positions

Sea Fury FB Mk II, VW238, 107/Q, No.802 NAS, HMS Vengeance, Cape Town (South Africa), January 1949. Extra Dark Sea Grey upper surfaces with Sky undersides; white codes, black serials. 'C' type roundels in four wing positions

Sea Fury FB Mk II, WG603, 138/CW, No.738 NAS, Culdrose, 1953. Extra Dark Sea Grey upper surfaces and spinner; Sky undersides. Black codes and serials; roundels in bright colours in six positions



Sea Fury FB Mk II, VR943, 105/R, No.801 Squadron NAS, HMS Glory, Korea, 1951. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Black/white bands around wings and rear fuselage; roundels in six positions

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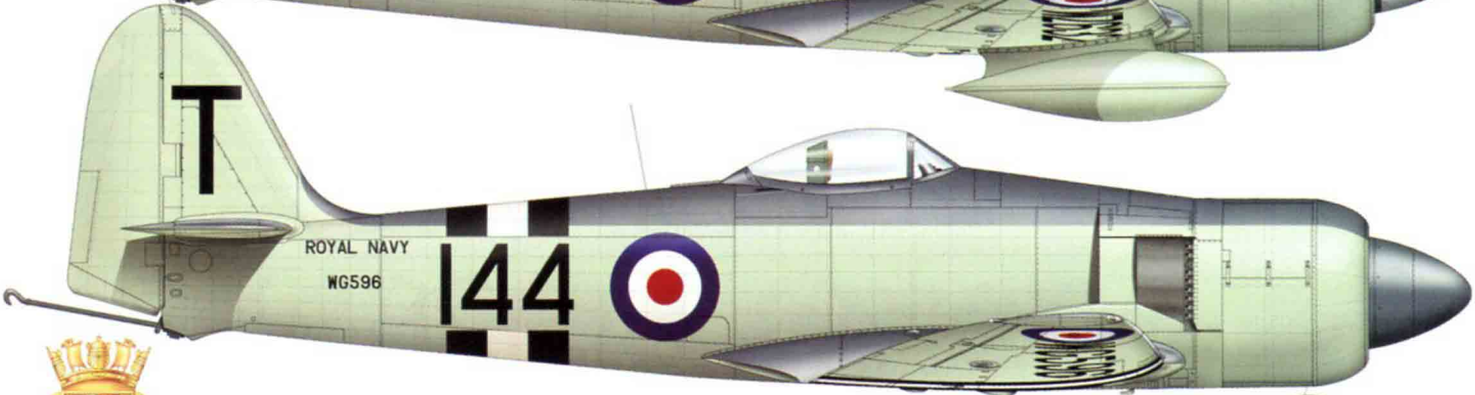
Sea Fury FB Mk II, WZ632, 155, No.804 NAS, Hal Far (Malta), March 1953. Extra Dark Sea Grey upper surfaces with Sky undersides; black serials and codes. Red/white spinner wit Extra Dark Sea Grey rear plate; roundels in six positions. Unit crest on fin; '5' repeated in black on mainwheel covers

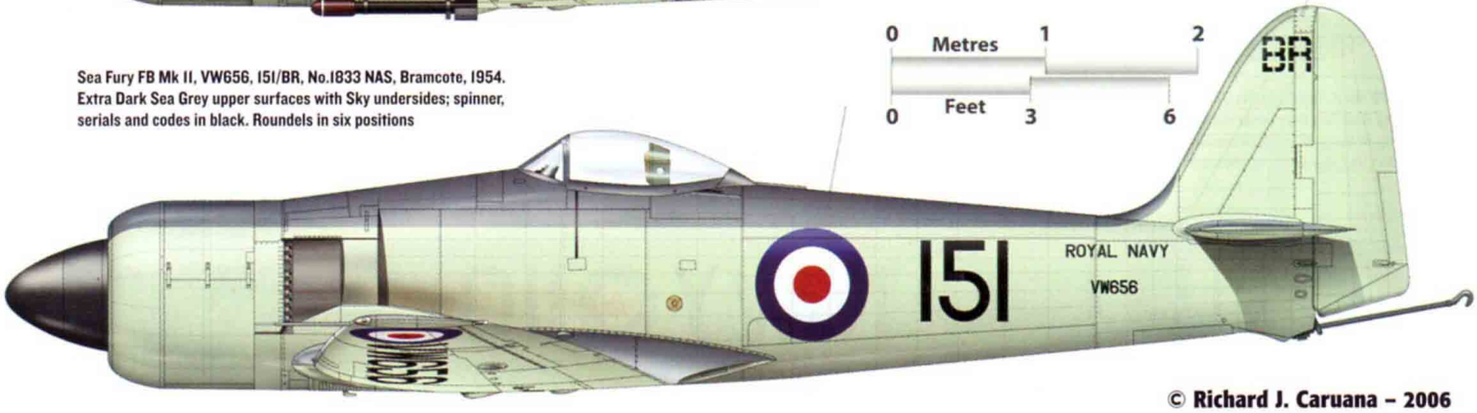


Below: Sea Fury FB Mk II, VX608, 098/FD, No.703 NAS, Ford, 1953. Extra Dark Sea Grey upper surfaces with Sky undersides; black spinner, serials and codes. Roundels in six positions

Above: Sea Fury FB Mk II, WG596, 144/T, No.898 NAS, HMS Theseus, 1953. Extra Dark Sea Grey upper surfaces and spinner with Sky undersides; black serials and codes. Black/white/black Home Waters exercise bands around rear fuselage and wings; roundels in six positions

Sea Fury FB Mk II, WE693, 106/C, No.810 NAS, HMS Centaur, 1954. Extra Dark Sea Grey upper surfaces and spinner, Sky undersides; black serials and codes. Roundels in six positions

Sea Fury FB Mk II, VW656, 151/BR, No.1833 NAS, Bramcote, 1954. Extra Dark Sea Grey upper surfaces with Sky undersides; spinner, serials and codes in black. Roundels in six positions



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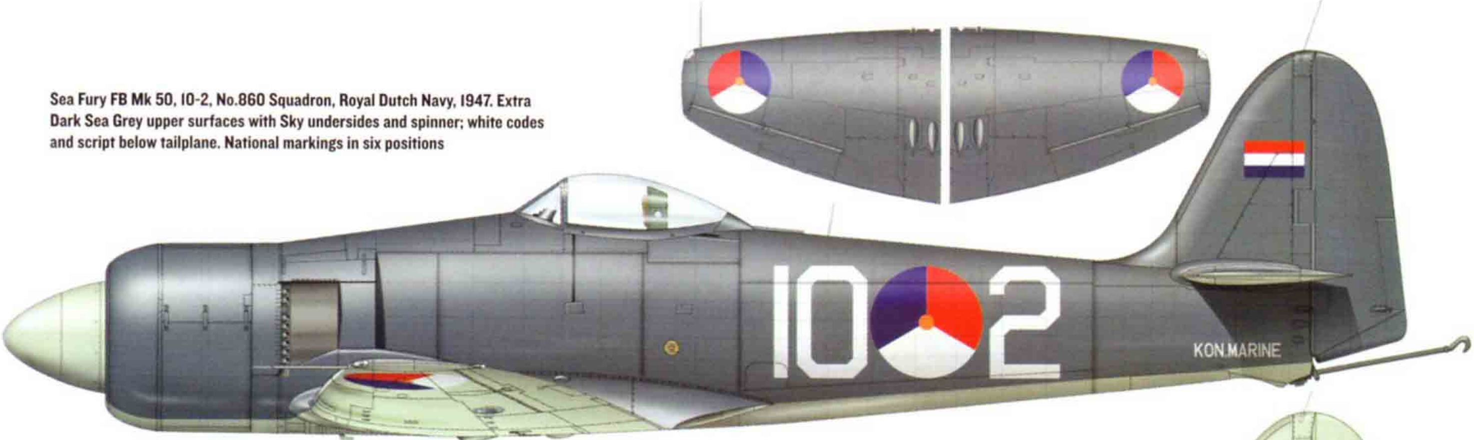
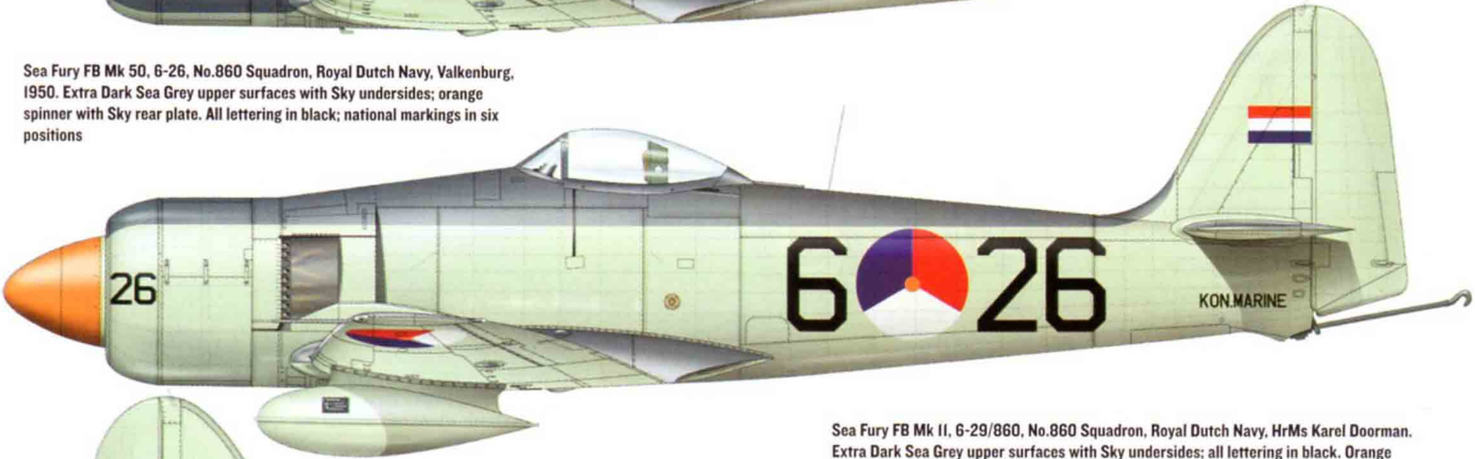
Sea Fury FB Mk 50, 10-2, No.860 Squadron, Royal Dutch Navy, 1947. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; white codes and script below tailplane. National markings in six positions



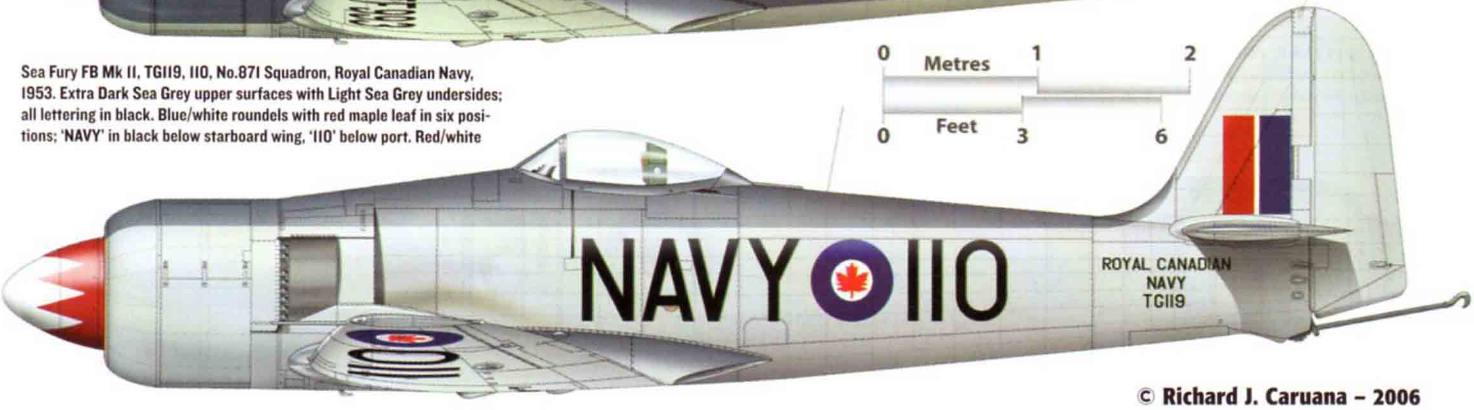
Sea Fury FB Mk 50, 6-26, No.860 Squadron, Royal Dutch Navy, Valkenburg, 1950. Extra Dark Sea Grey upper surfaces with Sky undersides; orange spinner with Sky rear plate. All lettering in black; national markings in six positions



Sea Fury FB Mk II, 6-29/860, No.860 Squadron, Royal Dutch Navy, HrMs Karel Doorman. Extra Dark Sea Grey upper surfaces with Sky undersides; all lettering in black. Orange cowling and spinner; national markings in six positions

Sea Fury FB Mk II, TF993, BC•B, No.803 Squadron, Royal Canadian Navy, 1948. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; codes and serials in white, the latter repeated in black below wings. 'C' type roundels above wings (note all roundels carry a black maple leaf on the red sector)

Sea Fury FB Mk II, TG119, 110, No.871 Squadron, Royal Canadian Navy, 1953. Extra Dark Sea Grey upper surfaces with Light Sea Grey undersides; all lettering in black. Blue/white roundels with red maple leaf in six positions; 'NAVY' in black below starboard wing, '110' below port. Red/white



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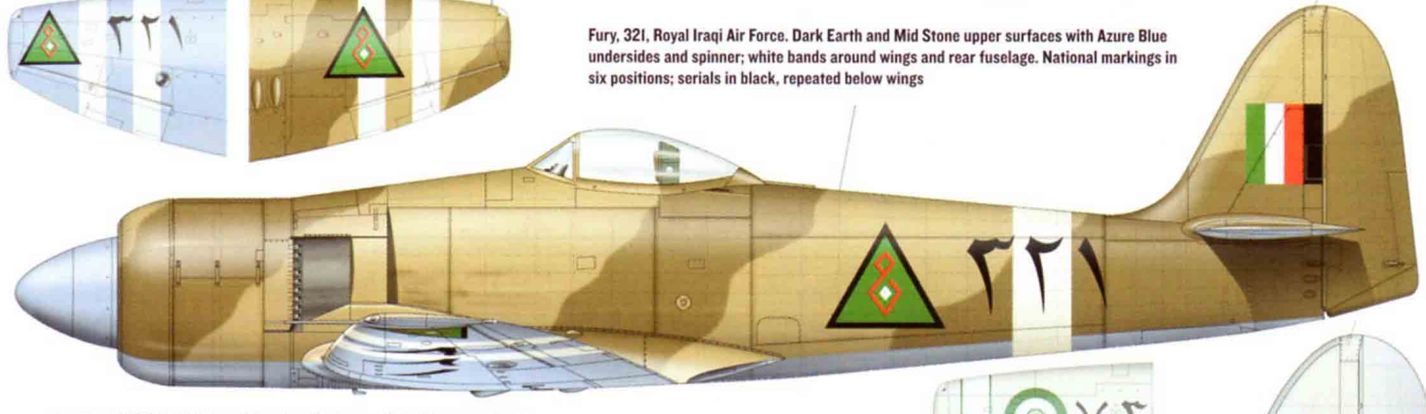
Sea Fury FB Mk II, WH589, 115/NW, No.805 Squadron, Royal Australian Navy (RAN), Bankstown, 1968. Oxford Blue overall with all lettering and spinner in white; national markings in six positions. Canopy frame unpainted

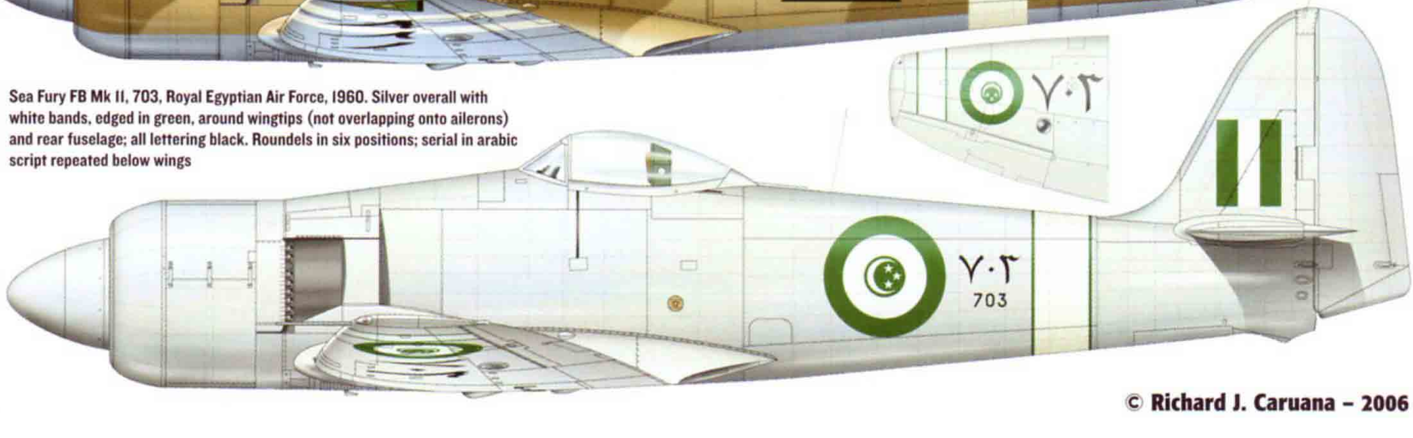
Sea Fury FB Mk II, WZ645, 103/K, No.805 Squadron Royal Australian Navy, HMAS Sydney. Extra Dark Sea Grey upper surfaces with Sky undersides; black lettering and red spinner. Aircraft written off in May 1955 after colliding with WZ642

Sea Fury FB Mk II, WE674, 105/K, No.805 Squadron Royal Australian Navy, HMAS Sydney, Korea, 1951. Extra Dark Sea Grey upper surfaces with Sky undersides and spinner; black lettering. Black/white bands around wings and rear fuselage; roundels in six positions. Lt (P) Clarkson (DFM) killed in this aircraft on 5 November 1951 whilst attacking enemy transports in the Han river area

Fury, 321, Royal Iraqi Air Force. Dark Earth and Mid Stone upper surfaces with Azure Blue undersides and spinner; white bands around wings and rear fuselage. National markings in six positions; serials in black, repeated below wings



Sea Fury FB Mk II, 703, Royal Egyptian Air Force, 1960. Silver overall with white bands, edged in green, around wingtips (not overlapping onto ailerons) and rear fuselage; all lettering black. Roundels in six positions; serial in arabic script repeated below wings



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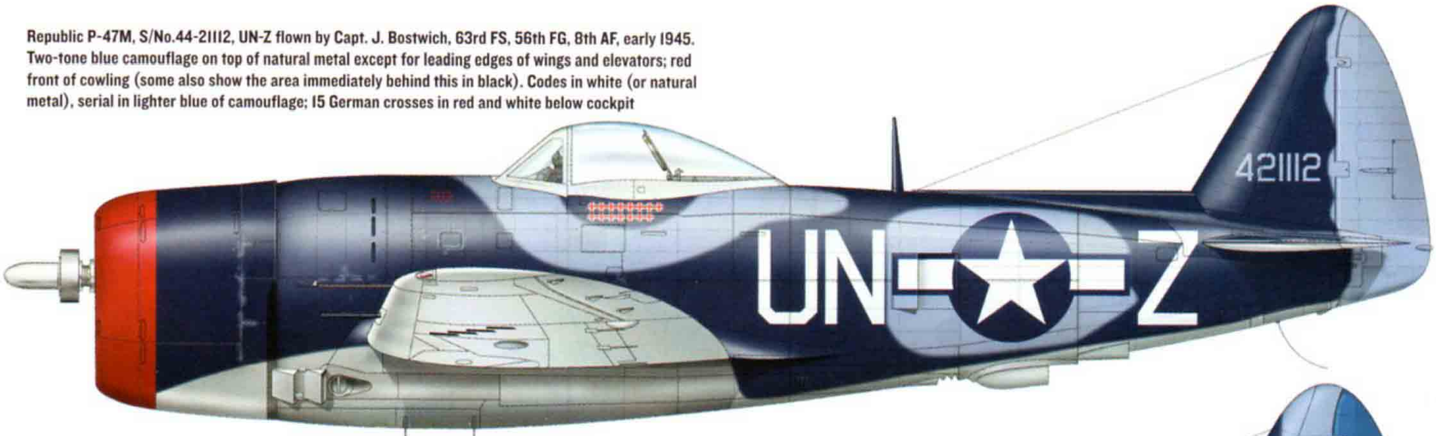
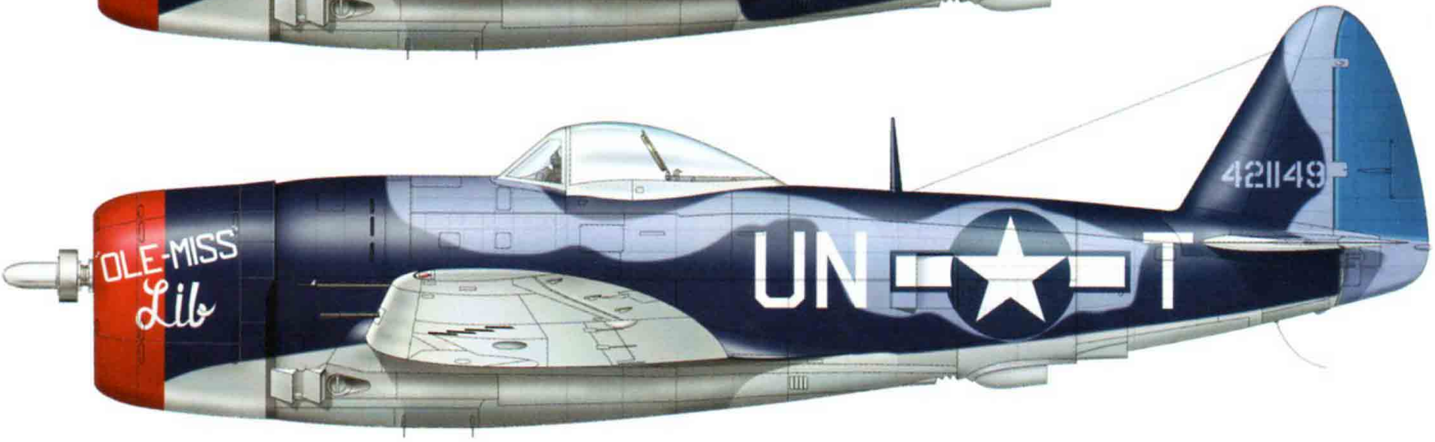
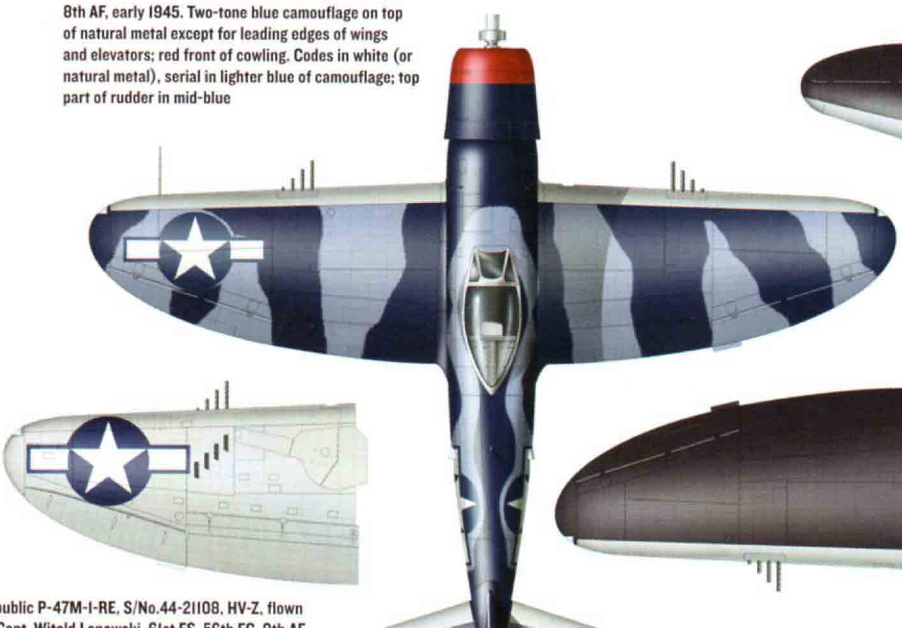
Republic P-47M, S/No.44-21112, UN-Z flown by Capt. J. Bostwich, 63rd FS, 56th FG, 8th AF, early 1945. Two-tone blue camouflage on top of natural metal except for leading edges of wings and elevators; red front of cowling (some also show the area immediately behind this in black). Codes in white (or natural metal), serial in lighter blue of camouflage; 15 German crosses in red and white below cockpit





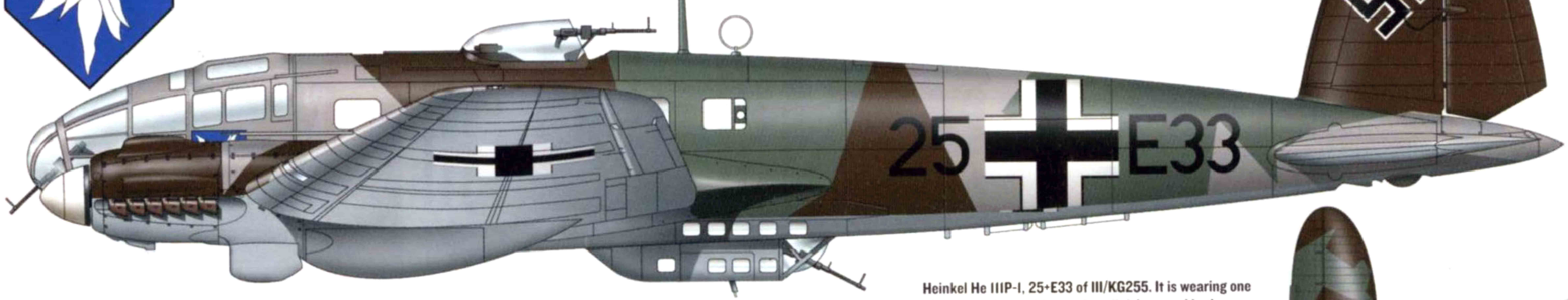
Republic P-47M, S/No.44-21149, UN-T, 'Ole-Miss Lib', flown by Lt Thomas W Smith Jr, 63rd FS, 56th FG, 8th AF, early 1945. Two-tone blue camouflage on top of natural metal except for leading edges of wings and elevators; red front of cowling. Codes in white (or natural metal), serial in lighter blue of camouflage; top part of rudder in mid-blue

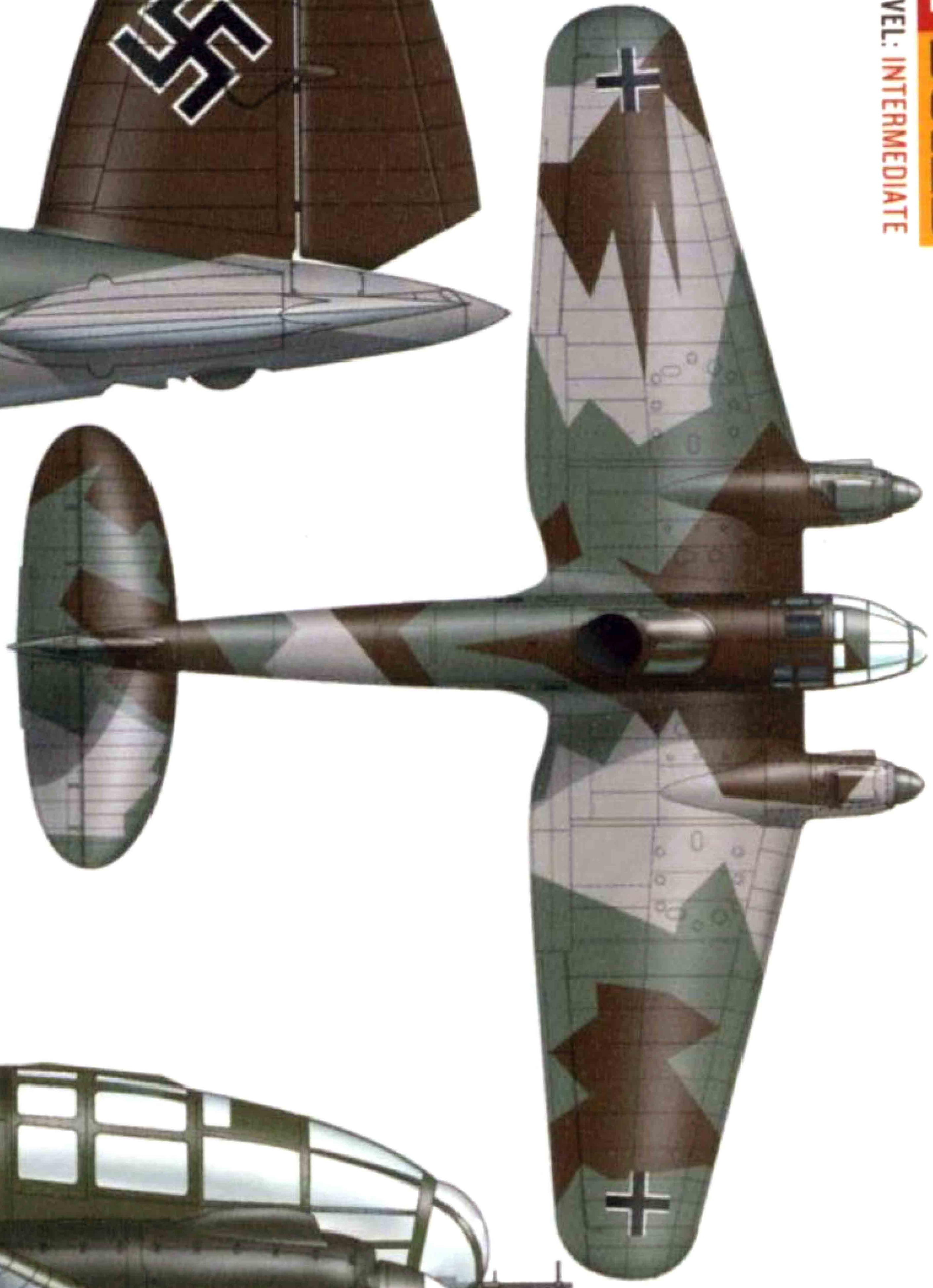


Republic P-47M-1-RE, S/No.44-21108, HV-Z, flown by Capt. Witold Lanowski, 61st FS, 56th FG, 8th AF, Boxted, early 1945. Originally natural metal overall, top surfaces painted in an automitive gloss black paint with a purplish sheen. Leading edges of wings, elevators and canopy frame remained natural metal; red front of cowling and rudder. Codes in red, outlined in silver (natural metal?); national markingsoutlined in silver or light blue on fuselage sides and above port wing

Note a real horseshoe bolted below the windscreen on the port fuselage side

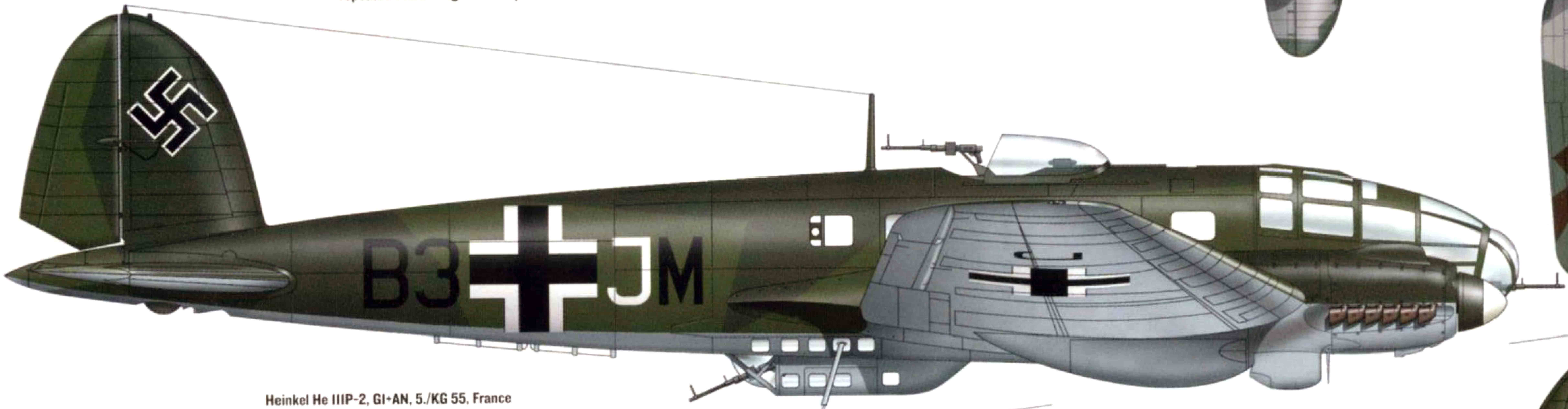
© Richard J. Caruana – 2006



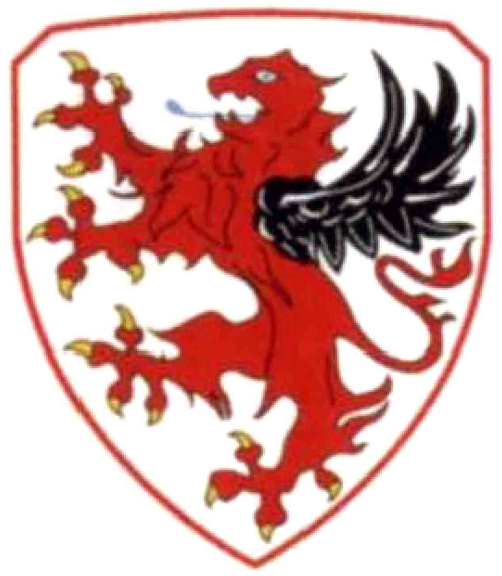


Heinkel He 111P-1, 25+E33 of III/KG255. It is wearing one of the experimental four-colour finishes used in the pre-war era. RLM 61/62/63 with 65 undersides; white spinner with black backplate

Heinkel He 111P-2, B3+JM, 4./KG 54, April 1940. RLM 70/71/65 finish with black codes; white aircraft letter 'J', repeated below wings. White spinner front half



Heinkel He 111P-2, G1+AN, 5./KG 55, France 1940. RLM 70/71/65 finish with Rot 23 spinners and individual aircraft letter 'A' (outlined in white); codes in black. 'A' repeated below wings



Profiles: 1/72 Scale

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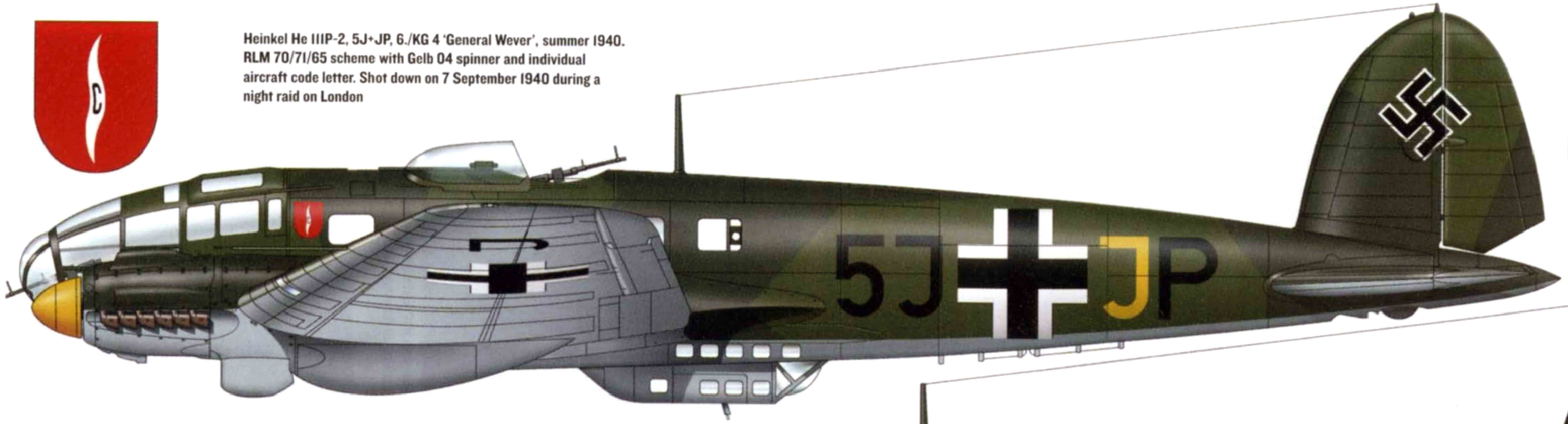
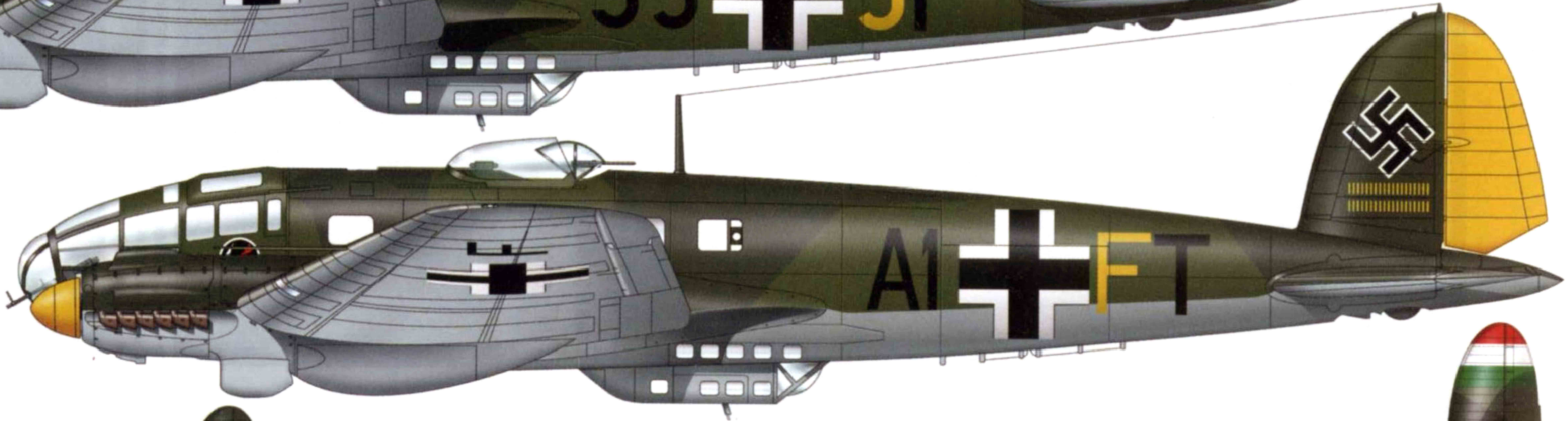
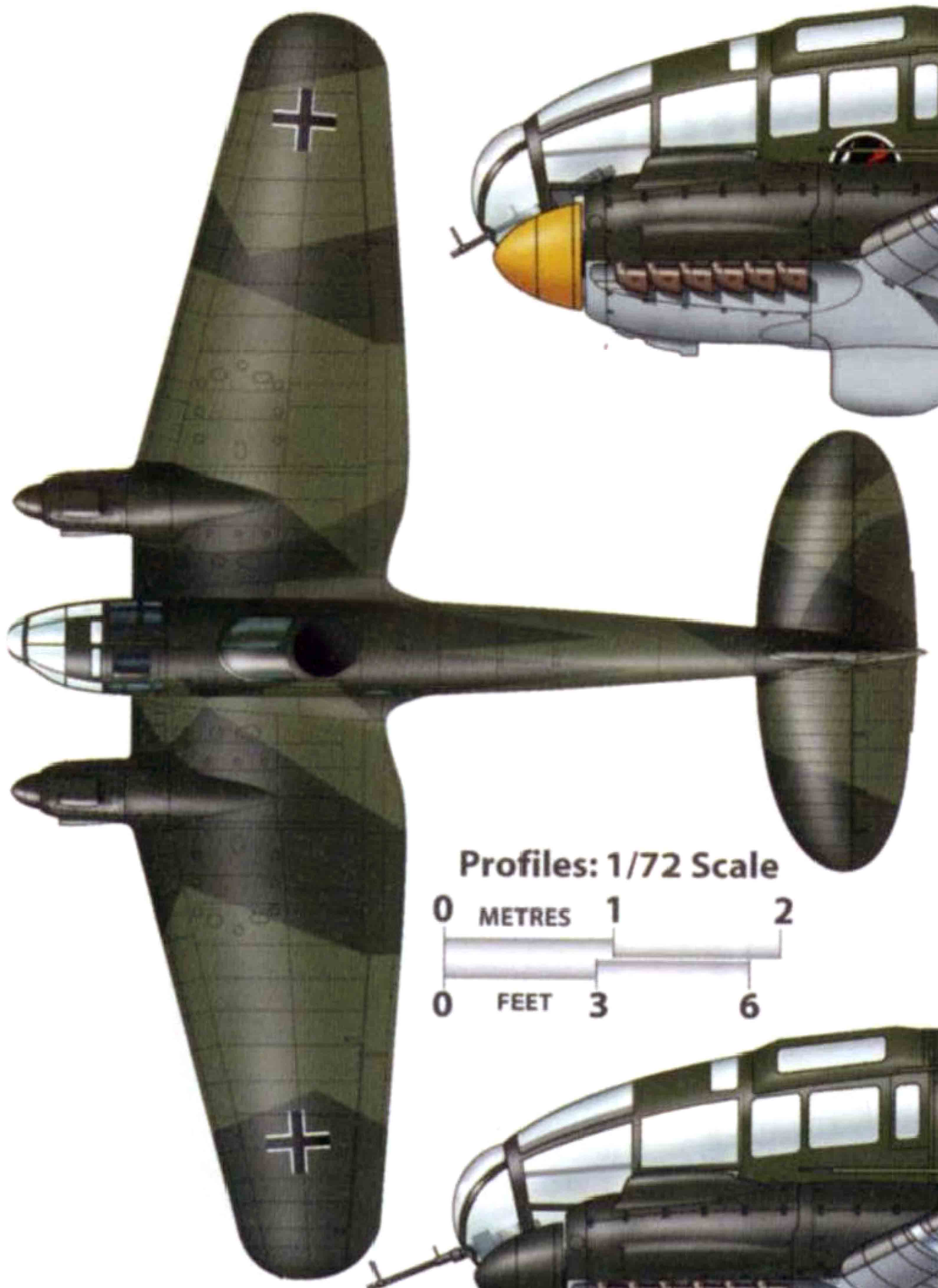
Heinkel He 111P-2, 5J+JP, 6./KG 4 'General Wever', summer 1940. RLM 70/71/65 scheme with Gelb 04 spinner and individual aircraft code letter. Shot down on 7 September 1940 during a night raid on London

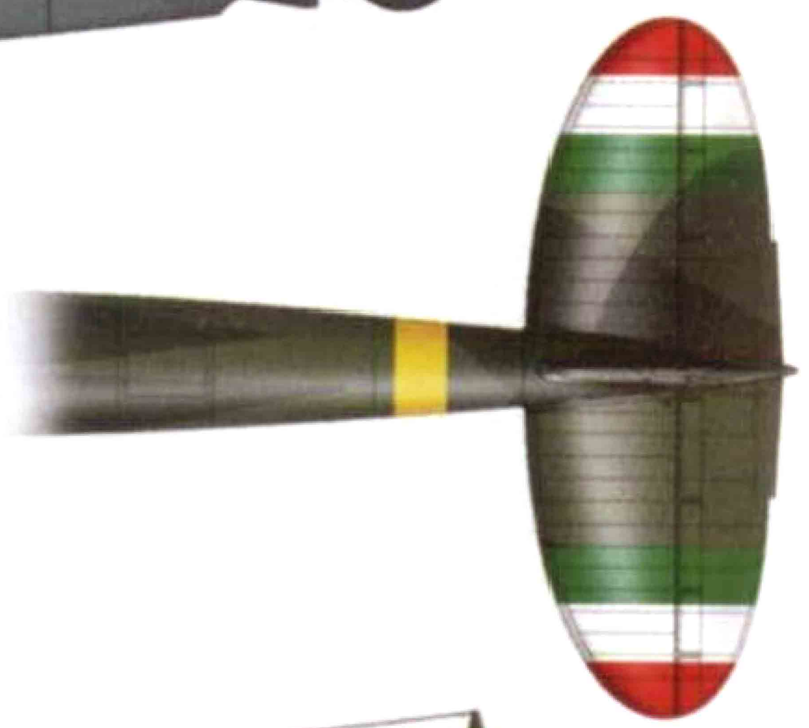






Heinkel He 111P-2, A1+FT of 9./KG 53 'Legion Condor', Lille-Nord, France, summer 1940. RLM 70/71/65 scheme with Gelb 04 spinners, rudder, and 'F' of the code. Note unit emblem just partly hidden by the engine cowling, and 'F' repeated under the wings

Heinkel He 111P-2, F.7+06, 1/1 Távolfelderitő Század, Hungarian Air Force, Poltava (Russia), January 1943. RLM 70/71/65 finish with Gelb 04 rear fuselage band and underside of wingtips; Hungarian crosses in white on black square in six positions. Green/white/red bands across top of fin/rudder and outer sections of horizontal tail surfaces



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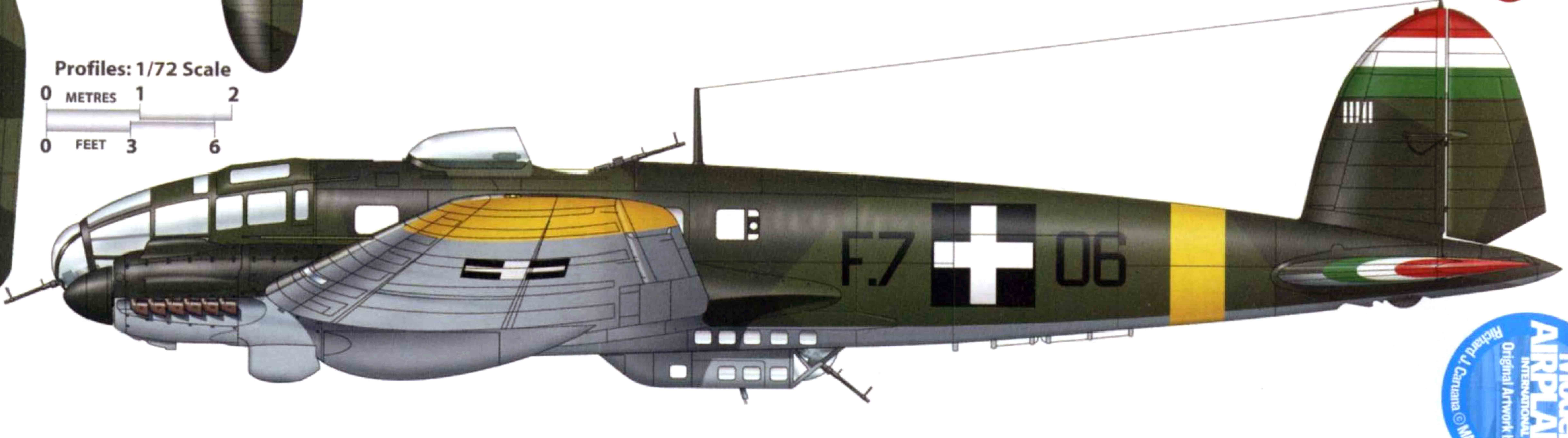


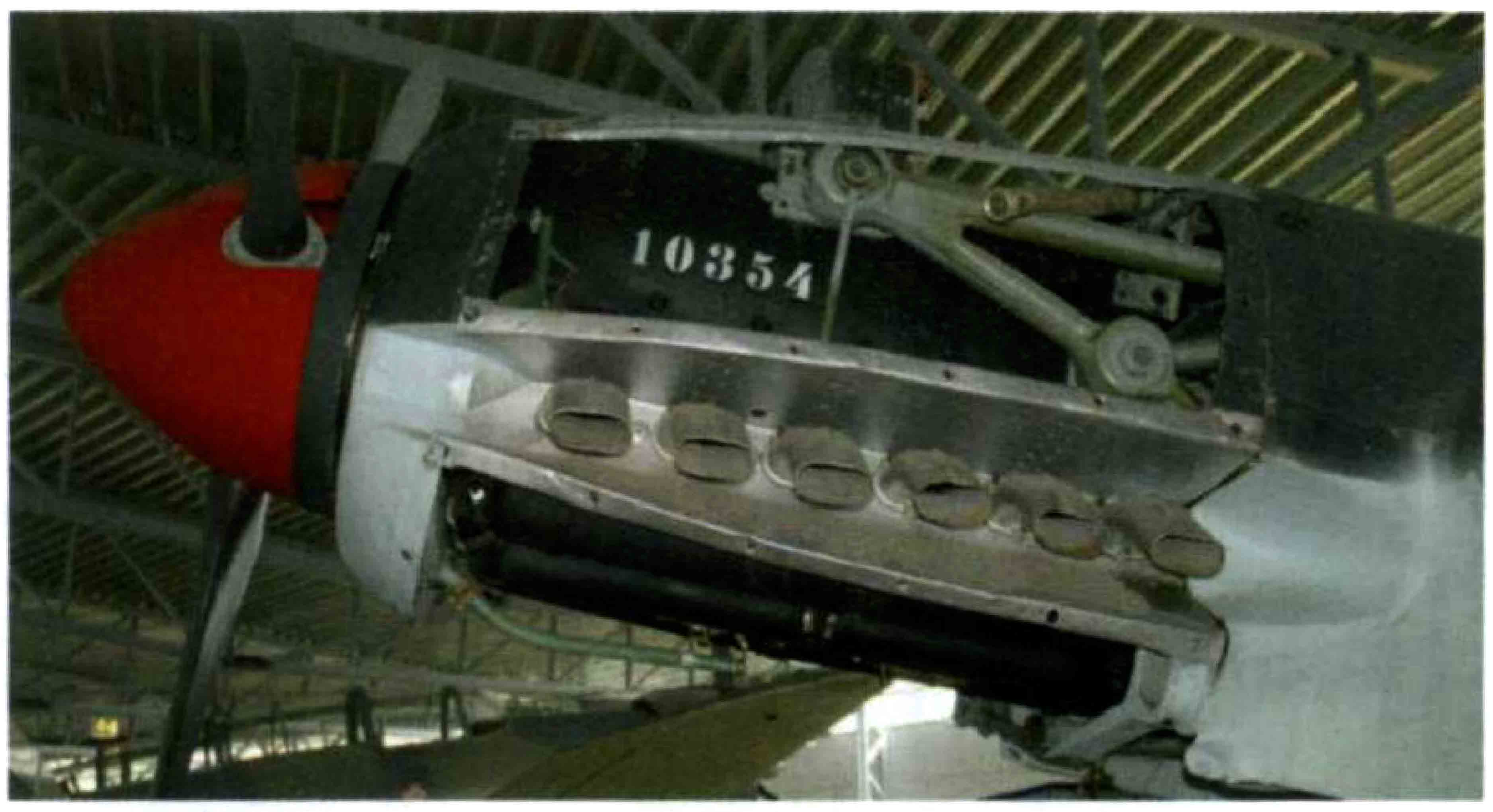
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

PHOTO ALBUM

Heinkel He 111P ©George Papadimitriou

This selection of photographs shows the Heinkel He 111P preserved at the Norwegian Air Force Museum at Gerdermoen near Oslo. This machine was recovered from its crash site in the 1970s and carefully restored over a number of years. It is a genuine wartime veteran, and was actually shot down in 1940 by some Blackburn Skuas.

The outboard face of the port engine nacelle, this time with the upper cowl section in place but the lower one removed



The same engine looking outboard (note the Northrop N3P in the background). This machine lacks engine cowls for this engine, or undercarriage doors, as these are parts that were either removed from or destroyed at the crash site

This view shows the front of the radiator under one of the engines. The slightly less than perfect fit of the cowls is all down to their repair during restoration, as this was an aircraft that crash-landed and was outside for 40+ years

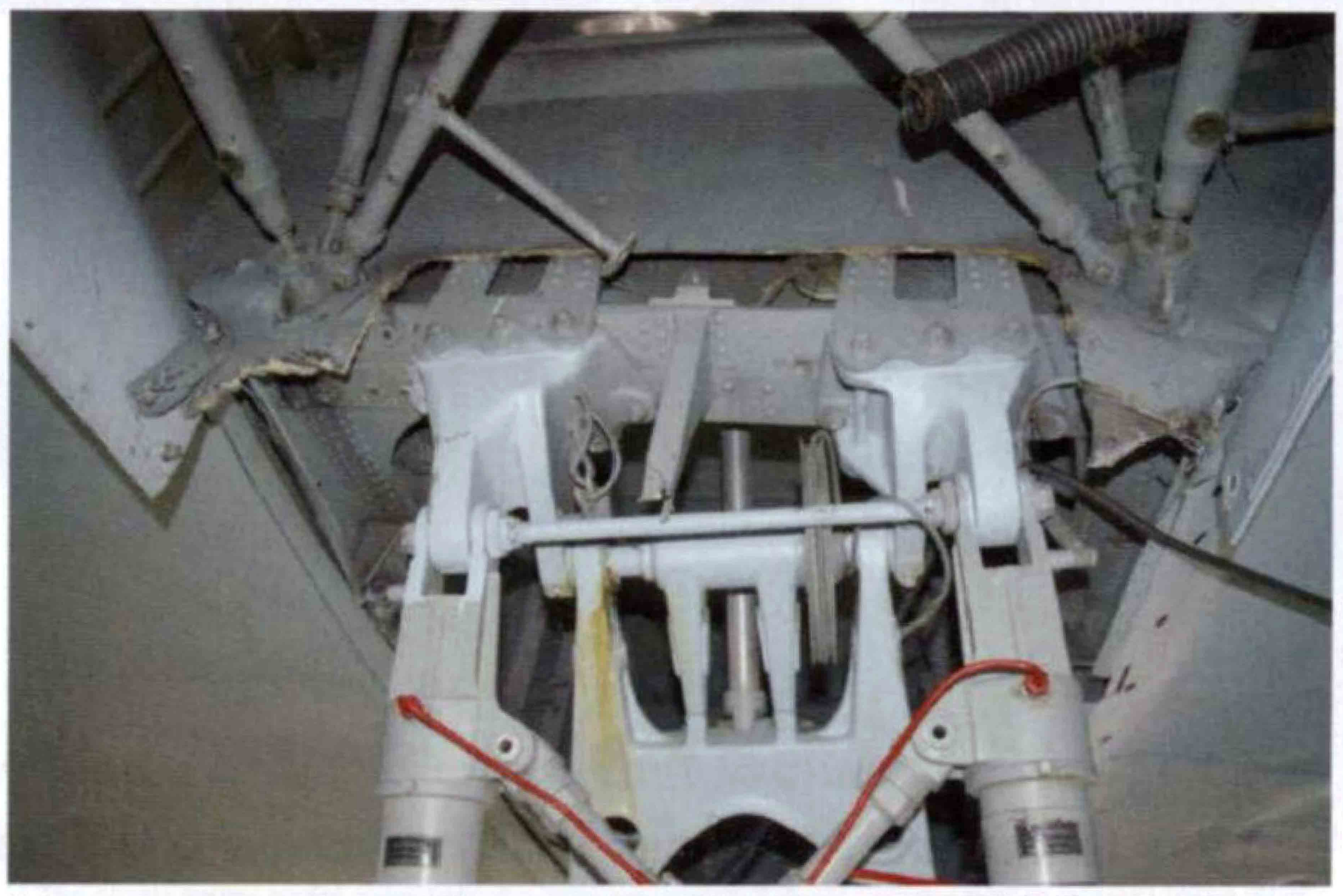
This is the aft bulkhead inside the port undercarriage bay

The dorsal gun position ('B Stand')

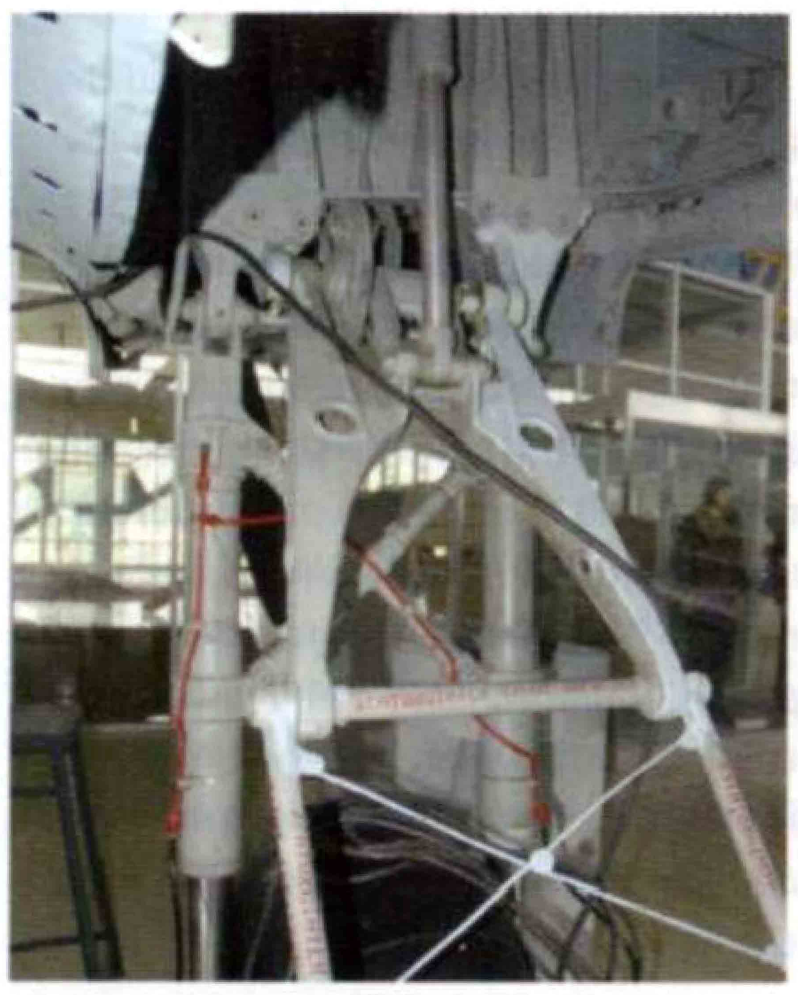
Close-up of the rotating cupola in the nose of the He III

The rather odd combination and shape of the glazing in the underside of the nose is well illustrated here

Overall shot of one of the main wheels



This is the same area as in the previous shot, this time viewed from the front, which is an area the engine cowls would usually cover, but they are not fitted here



While this view from the back of the undercarriage shows all the framework and bracing wires, as well as the warning stencils

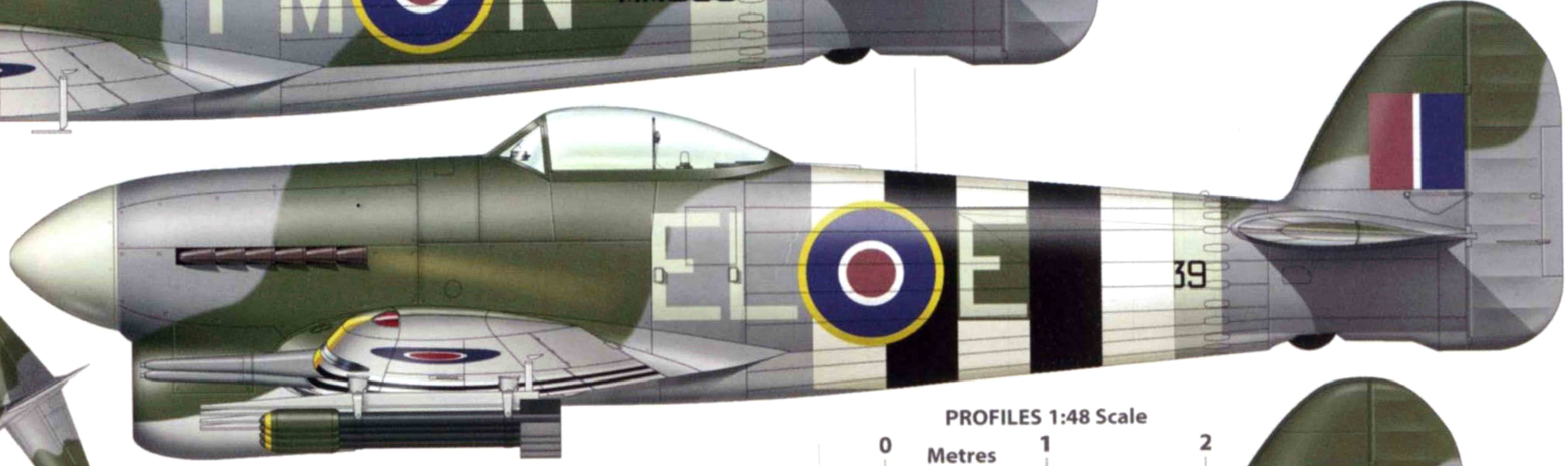
A very useful shot for those of you using the Eduard bomb bay set, this shot is looking up into the vertical bomb cells

This slightly lower perspective shows the doors and their hinge points. The deflectors correctly seen in the Eduard set and on John's model no longer exist on this machine

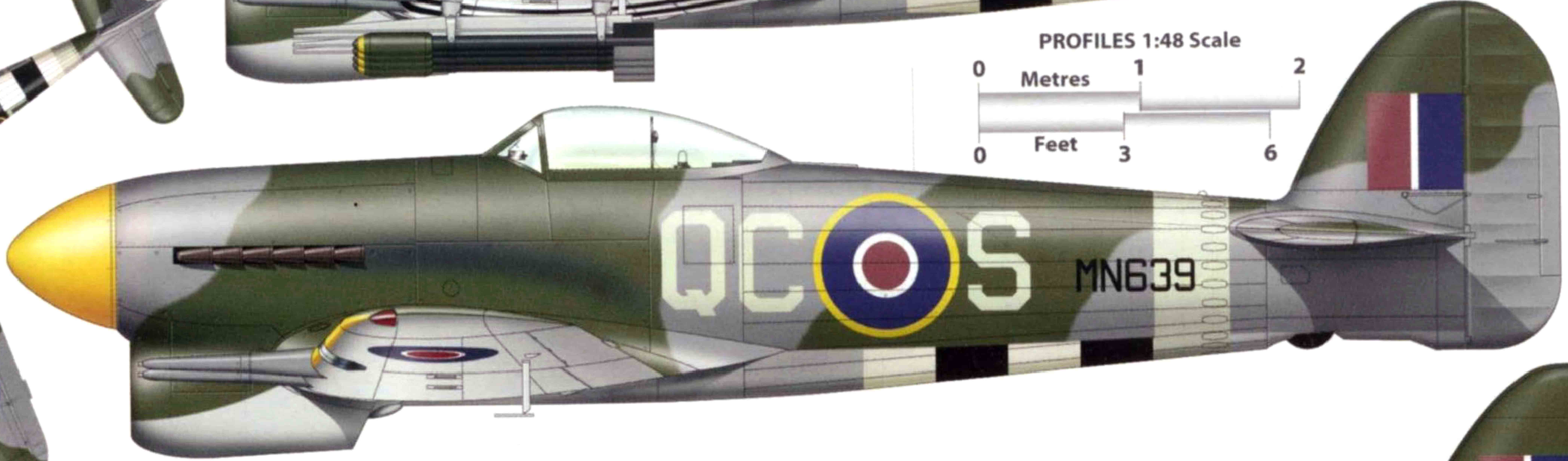
This overall view of the nose area clearly shows the 'sucking in' that occurs behind the cupola, as mentioned by John in his article and lacking on the Hasegawa kit

The ventral gondola ('C Stand')

Left: Hawker Typhoon Mk Ib, MM955/FM-N, No. 257 Squadron, Tangmere, March 1943. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky rear fuselage band, spinner and codes; Night serials. 'B' type roundels above wings, 'C' type below



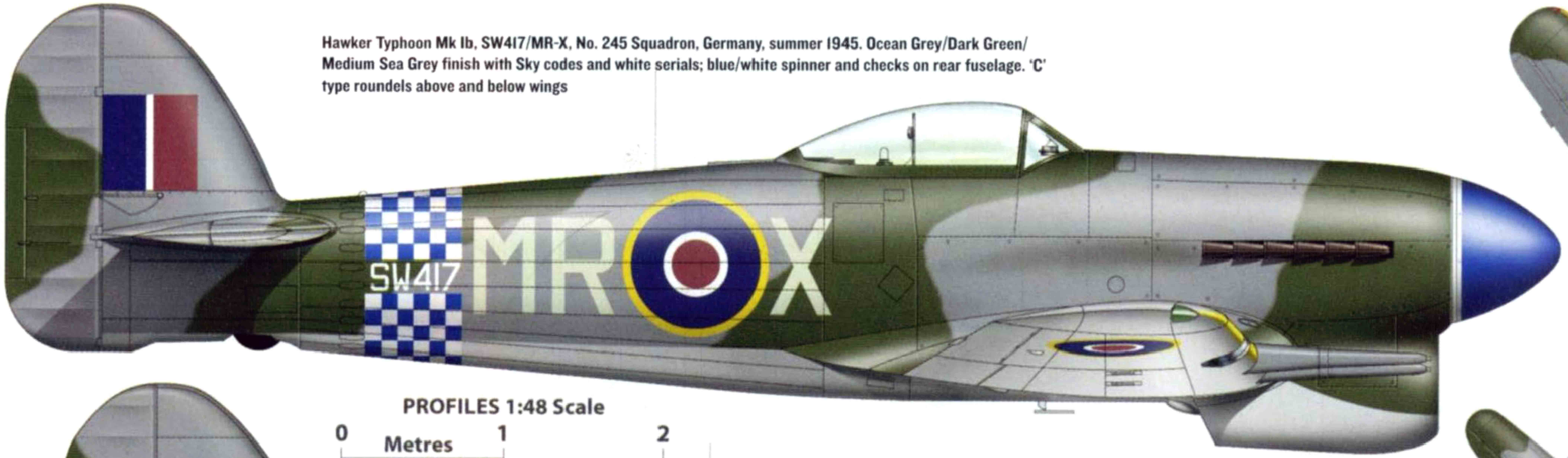
Below: Hawker Typhoon Mk.Ib, MN639/EL-E, No. 181 Squadron, France, summer 1944. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky spinner, rear fuselage band and codes; Night/white bands around fuselage and wings. Night serial, partly overpainted by D-Day bands; 'C' type roundels below wings

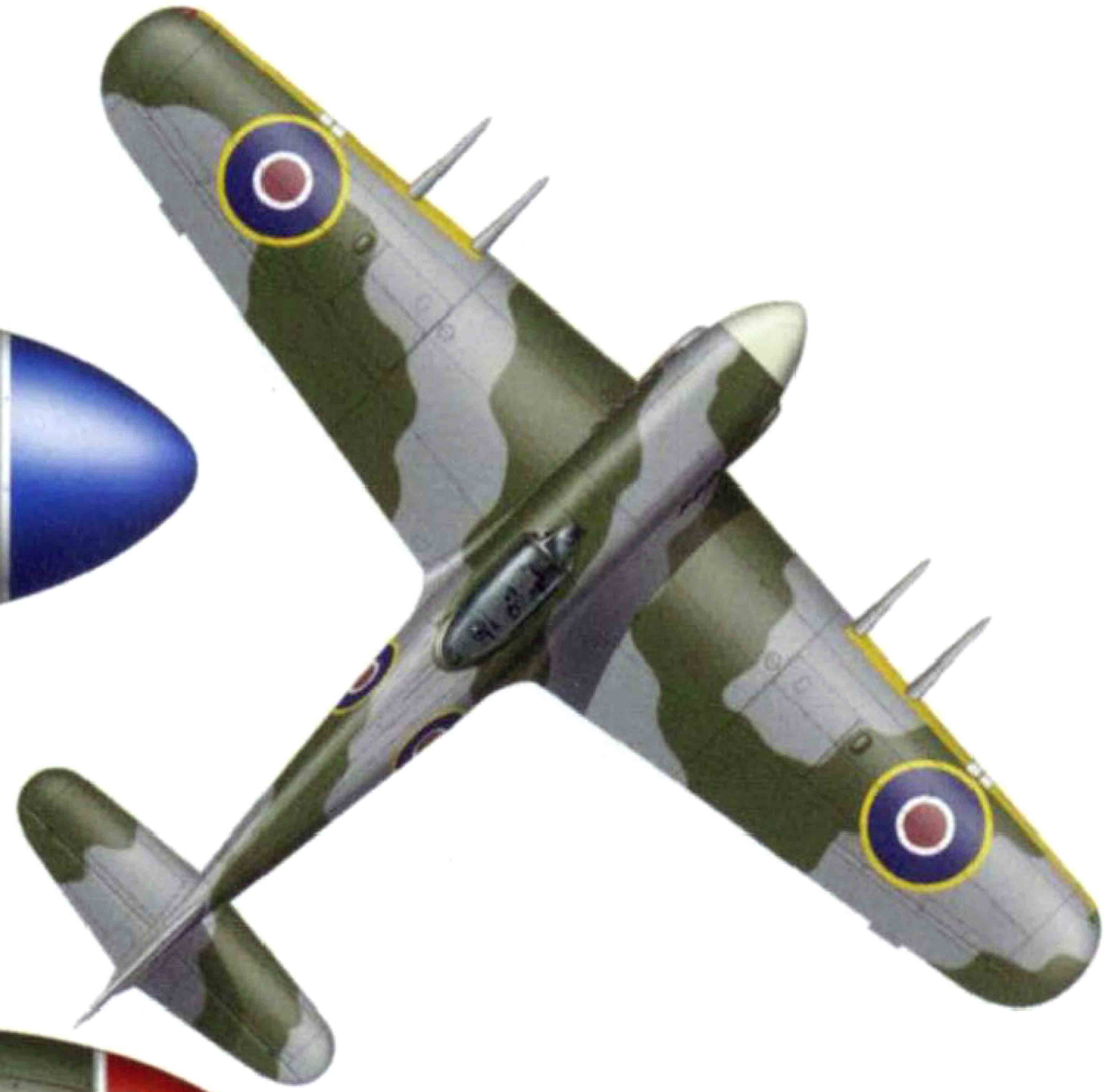


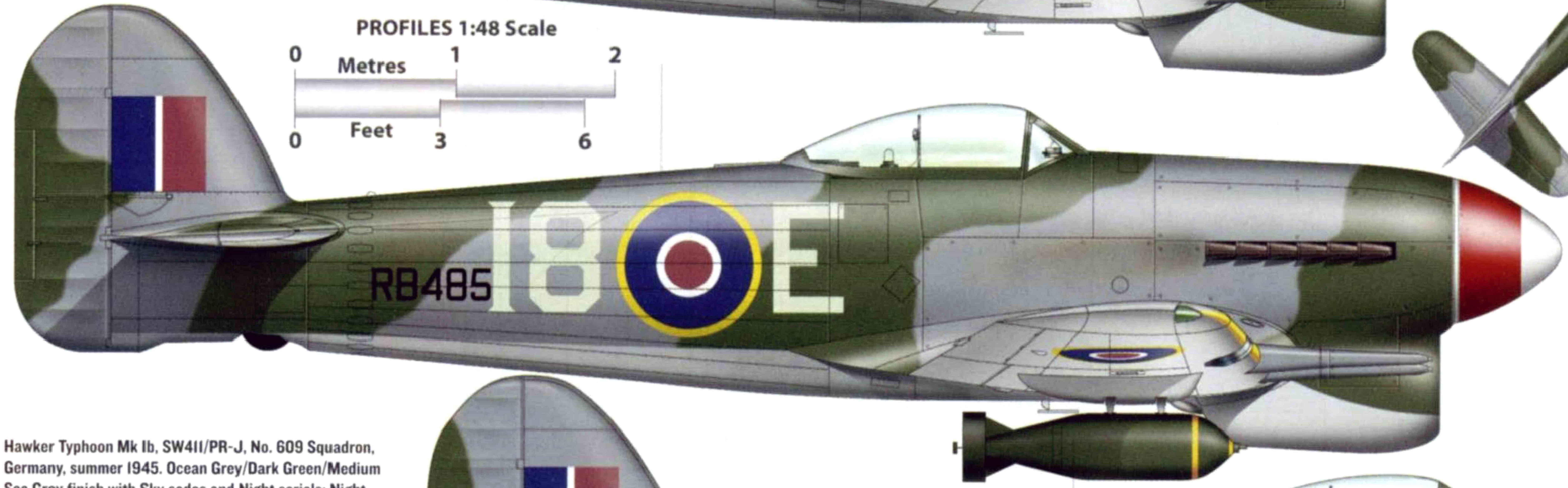
Above Right: Hawker Typhoon Mk Ib, QC-S, No. 168 Squadron, Eindhover, late 1944. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky rear fuselage band and codes (note 45o angled US-style corners); Night serials. Night/white stripes below rear fuselage only; yellow spinner and wing leading edges. 'B' type roundel above wings, 'C' type below

Right: Hawker Typhoon Mk Ib, MN582/HH-A, No. 175 Squadron, B.5, August 1944. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes and rear fuselage band; Night spinner and serials. Night/white bands around wings and below fuselage; 'B' type roundels above wings, 'C' type below. Long-span tailplane fitted

Hawker Typhoon Mk Ib, SW417/MR-X, No. 245 Squadron, Germany, summer 1945. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes and white serials; blue/white spinner and checks on rear fuselage. 'C' type roundels above and below wings

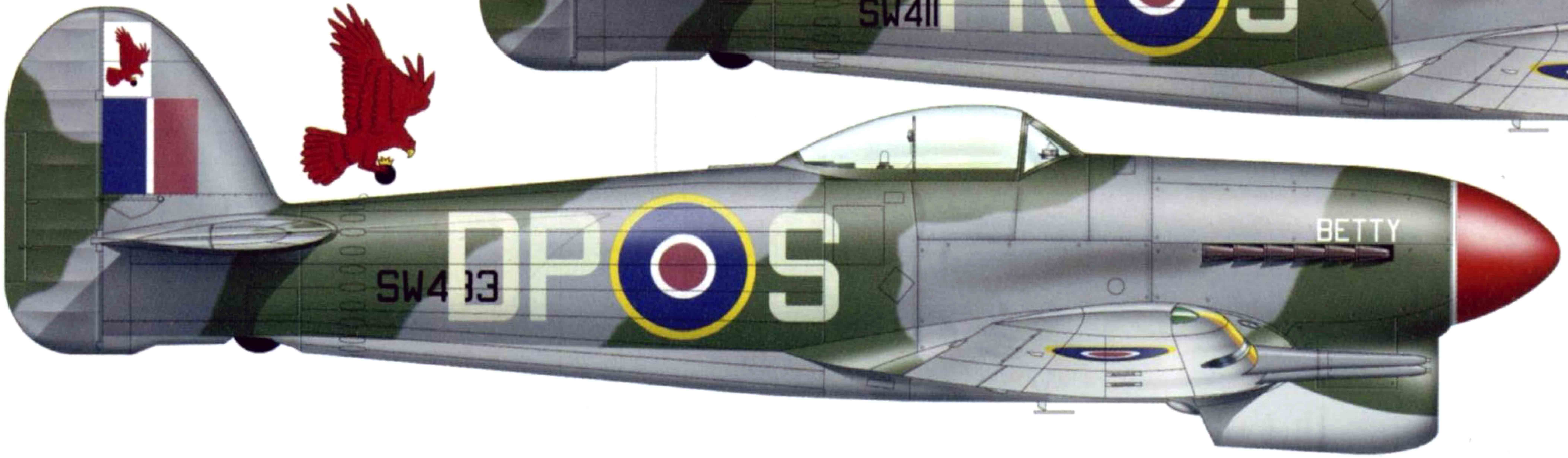






Hawker Typhoon Mk Ib, RB485/18-E, No. 440 Squadron, Flensburg, 1945. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes and Night serials; red/white spinner (white rear plate). Yellow wing leading edges; long-span 'Tempest' tailplane

Hawker Typhoon Mk Ib, SW411/PR-J, No. 609 Squadron, Germany, summer 1945. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes and Night serials; Night spinner with yellow backplate. 'C' type roundels in six positions; yellow wing leading edges. Unit badge on front fuselage with Squadron Leader's pennant aft; long-span tailplane. Aircraft flown by Sqn Ldr 'Pinkie' Stark



Hawker Typhoon Mk Ib, SW433/DP-S, No. 193 Squadron, Germany, August 1945. Ocean Grey/Dark Green/Medium Sea Grey finish with Sky codes and Night serials; red/white spinner. 'C' roundels in six positions; yellow wing leading edges. Unit badge on fin within a white rectangle

THE McDONNELL F-4J PHANTOM

Although the McDonnell Aircraft Company did not contribute to aircraft production in WWII, their first major project moved into an entirely new sphere - jet propulsion

WRITTEN BY RICHARD CARUANA

Although James S. McDonnell formed the McDonnell Aircraft Company (MAC) in a small building adjacent to St Louis Municipal airport on 6 July 1939, the wartime years were dedicated to its formation and growth without any significant contribution to the war effort. Significant was the fact that rather than working in parallel with other aircraft manufacturers in the United States (US), the new company's first major project moved into an entirely new sphere – that of jet propulsion. Early in 1943 an order was placed with MAC by the US Navy for a jet fighter that could operate from its existing fleet of carriers. McDonnell responded with the XFD-1 that flew for the first time on 25 January 1945, later to become the FH-1 Phantom. Although built in small numbers, the Phantom was deemed to be a highly satisfactory aircraft and was developed further into the F2D (later F2H) Banshee in 1947, a hardworking protagonist of the Korean War of which 895 examples were eventually built.

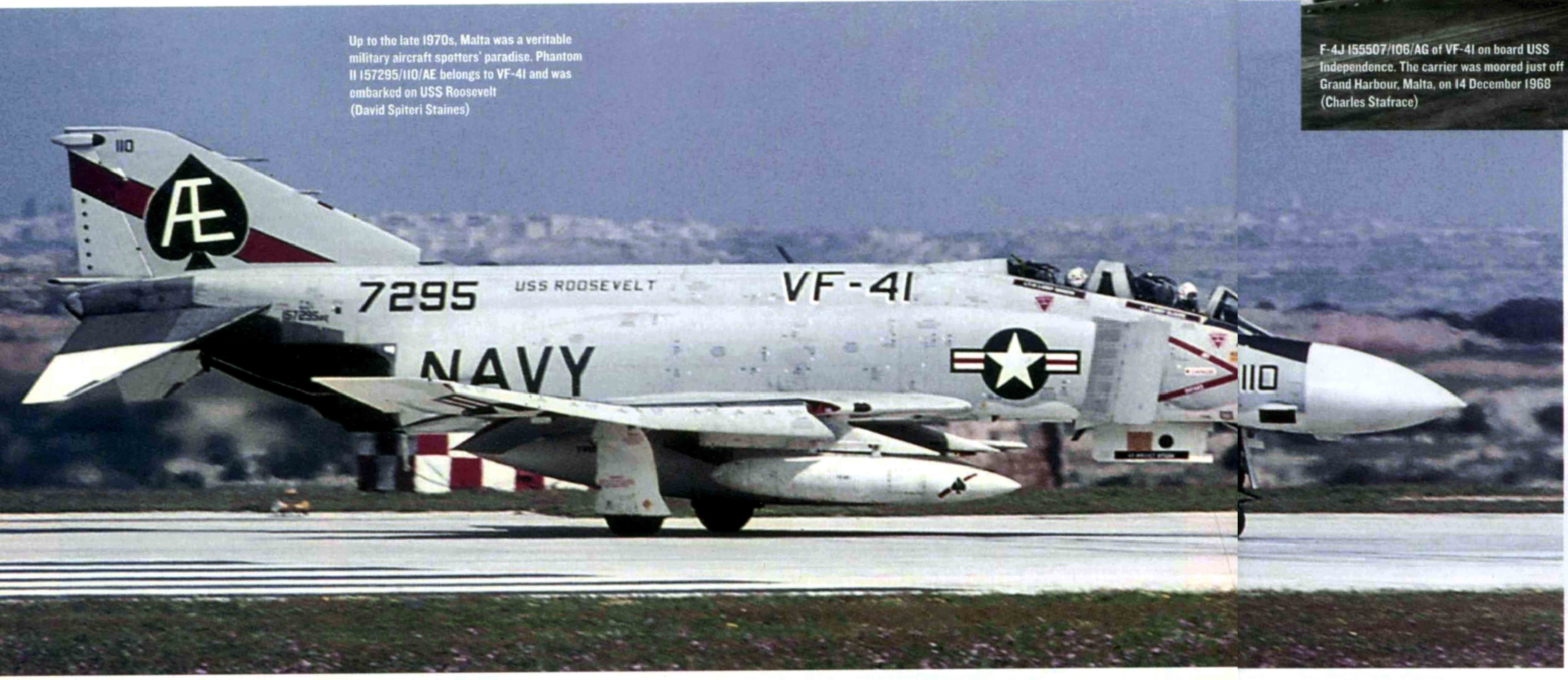
MAC became a very busy little entity during the immediate post-war period, especially in the experimental field. It was responsible for the XF-85 Goblin, the tiny jet 'parasite' fighter that was stored and launched from the bomb-bay of a B-36. Its next major successful product for the US Navy was the F3H Demon that flew for the first time on 7 August 1951. As if to ensure that it would not become entirely dependent on naval aircraft, the company produced the superb F-101 Voodoo for the US Air Force (USAF), a high-powered twin-engined fighter of sleek design that first flew on 29 September 1954. This aircraft was, in fact, based on an earlier experimental MAC design, the XF-88 that carried the same name and which had performed its maiden flight way back in October 1948.

Within a relatively short period of time, McDonnell had established itself as a major player in the North American aviation industry, with an excellent reputation for high workmanship, design and structural facilities. The loss of a competition in May 1953 to build the US Navy's first supersonic interceptor to Chance Vought came, therefore, as a great disappointment for MAC. Undaunted, McDonnell knew that it could produce a better product than anyone else, and set out to prove it.

Their first course of action was to listen to what the people that mattered in the US Navy really needed, taking notes and filling numerous questionnaires. They talked to the Chief of Naval Operations (CNO), the Head of Fighter Branch and the teams at the Bureau of Aeronautics (BuAer). Of immense importance was the feedback received from personnel of the Overhaul and Repair facilities. Visits to the company's facilities at St Louis were also arranged for anyone interested in its project. Within 12 months, MAC had actually built a mock-up under the company designation of F3H-G, which the Navy was invited to inspect. As a result, a letter of intent was issued requesting the construction of two aircraft based on the mock-up but powered by General Electric J79 engines, when these would become available, in place of MAC's original plan for the use of a pair of Wright J65s.

F-4J 155562 of VF-84 taxies out to Runway 06 at Luqa, Malta, in April 1971 (David Spiteri Staines)

F-4J 155507/106/AG of VF-41 on board USS Independence. The carrier was moored just off Grand Harbour, Malta, on 14 December 1968 (Charles Stafrace)



Up to the late 1970s, Malta was a veritable military aircraft spotters' paradise. Phantom II 157295/110/AE belongs to VF-41 and was embarked on USS Roosevelt (David Spiteri Staines)

> **"The future of the Phantom II changed completely following a visit to the St Louis works by four naval officers in April 1955. The Navy now seemed to know exactly what it needed - and it wasn't the AH-1"**

Although work went ahead on what now was known as the AH-1 'Phantom II', it seemed that the Navy had no real requirement for such an aircraft and McDonnell began to suspect that this was nothing more than a consolation prize for loosing out to the Crusader. At this stage the aircraft looked very much like a cross between the Voodoo and the Demon, a single-seater fitted with a powerful radar, four 20mm cannon under the nose and an impressive array of hardpoints under the wings, eleven to be exact, clearly determining its intended role as that of a multi-role attack aircraft. Variable geometry air intakes for the engines ensured peak performance at all speeds and altitudes, enabling it to reach Mach 1.5 and higher.

The future of the Phantom II changed completely following a visit to the St Louis works by four naval officers in April 1955, two from the BuAer and two from the CNO. The Navy now seemed to know exactly what it needed – and it wasn't the AH-1; they wanted another fighter for fleet defence, capable of staying on Combat Air Patrol (CAP) for at least two hours, flying out as far as 250 nautical miles, destroying any enemy aircraft within that range, and returning to the carrier after three hours.

Most of the work that had gone into the AH-1 had to be undone, the mock-up torn apart and the engineering studies revised. The versatility of MAC's design team here came to the fore, as the Phantom II was changed into a two-seat, all-weather interceptor powered by a pair of J79s. All but one of the underwing pylons were removed (retaining the centreline pylon for an external fuel tank). Gun armament was exchanged for four Sparrow Air-to-Air Missiles (AAMs) partially submerged into the fighter's flat-bottomed fuselage. Within a fortnight, a revised and fully detailed specification was written around the project, now bearing the designation of XF4H-1, and accepted.

A pair of F-4J Phantom IIs from USS Saratoga's VF-103 on Park 4 at Luqa, Malta, om July 1970. The aircraft are 155826/200 and 155824/213 (Godfrey Mangion)

Authority to proceed was issued to McDonnell on 26 May 1955, for the detail design and construction of the two prototypes already contracted, though not on an exclusive basis! The specification was also passed on to Chance Vought, who proposed the XF8U-3 Crusader III as competitor.

The US Navy's decision to have a competing aircraft, notwithstanding the extra costs, stemmed from reasonable fears that McDonnell's aircraft just might not make the grade. While the Phantom II was a completely new aircraft, the Crusader III was but an updated version of Chance Vought's already well-established naval fighter aircraft. The XF4H-1 flew for the first time on 27 May 1958 at Edwards Air Force Base (AFB) where it also carried out its flight trials. The fly-off against the first of five XF8U-3s took place later that same year, turning out to be a stiff contest between two extremely valid designs. However, the Navy ultimately chose the Phantom II, preferring its twin-seat, twin-engined design to the single-seat, single-engine layout of the Crusader III. A limited contract for 23 development aircraft (including the two prototypes) was awarded to MAC in December 1958, together with an order for 24 production aircraft.

Once the afterburner was engaged, the aircraft comfortably reached Mach 2.03, and dng an early trial with a pre-compressor water-injection cooled F4A, a speed of Mach 2.62 was registered

THE PHANTOM II EMERGES

With the redesign work that went into turning the AH-1 into the F4H-1, McDonnell introduced a long list of changes into their original design concept. The first concerned the air intakes and ducts for the more powerful J79s, having machined leading edges and variable inlets – the latter being an innovative feature for any fighter aircraft.

Wings of completely different layout were produced with the outer folding panels being extended and tilted up 12° to achieve a sizeable 'dog-tooth'. Also extended were the vertical tail surfaces while the one-piece 'stabilators' – acting as stabiliser and elevator combined – were at first tilted down 15°, then further down to 23°.

Another highly visible difference between the prototypes and the first production models was the larger nose that could accommodate the Westinghouse APQ-72 intercept radar, while overall length was kept within the 56ft limit dictated by the lifts of the Midway-class aircraft-carriers. The main undercarriage legs were beefed up to withstand a landing impact of 33,000lb at a sink rate of 22ft per second while the nosewheel could be extended by 20ins for catapult launches and introduced an innovative 360° power steering.

Performance of the F-4A, as the initial production model was designated, was impressive, to say the least. While it might be considered valid even by today's standards, it must have been nothing short of stunning in 1958! The aircraft performed better in practically all respects compared to the specified requirements (shown in parentheses): maximum speed at full military power - Mach 1.1 (0.99), rate of climb - 17,500ft per minute (12,258ft/min), time to climb to 35,000ft – 1min 13sec (1min 30sec), supersonic combat ceiling on maximum power - 56,900ft (55,430ft). Once the afterburner was engaged, the aircraft comfortably reached Mach 2.03, and during an early trial with an F-4A equipped with pre-compressor water-injection cooling, a speed of Mach 2.62 was registered when the pilot decided to throttle back fearing that he might run out of water.

The first 47 aircraft built (F-4A) were powered by J-79-GE-2 turbojets and could carry four Sparrow III AAMs. 26 of these Phantom IIs were assigned to various development tasks while the rest were delivered to the first US Navy units to operate the type, VF-101 and VF-121. Between 1961 and 1966, McDonnell built and delivered 649 F-4Bs, the first major production version. These were powered by the uprated J-79-GE-8 engines and were equipped with the AJB-3A bombing system to aid delivery of 16,000lb of ordnance carried on four underwing pylons. While the APQ-72 system for the delivery of the Sparrows was retained, it also carried an AAA-4 infra-red sensor in a bulged fairing beneath the nose for the firing of Sidewinder missiles fitted to underwing stations.

Another view of 155562 of VF-84 at Malta, this time parked with the refuelling probe extended (Godfrey Mangion)

THE SUPERB F-4J

Other versions included the 46 dual-control RF-4Bs for the US Marine Corps and 583 F-4Cs for the USAF, the latter broadly based on the F-4B. The US Navy took note of the improvements introduced into the USAF's version of the Phantom II, issuing a specification in 1963 for an F-4B follow-up incorporating a considerable number of changes. Since MAC was updating the F-4C to the F-4D for the USAF, it developed the F-4J in parallel, although the latter was to result in a more advanced and sophisticated fighter aircraft, with an emphasis on CAP.

The first major change consisted in the fitting of the Westinghouse APG-59 pulse-doppler radar incorporated into a new integrated missile control system (AWG-10) that could fit into the nose of the F-4B, while the AWG-10 was placed in the No.1 fuel cell, now reduced in size. An additional fuselage fuel cell (No.7) was fitted inside the rear fuselage. The new fire control system could track both high- and low-flying targets. The infra-red fairing was removed from beneath the nose as a completely new suite of electronic warfare equipment was fitted, including the APR-32 homing and warning, an ALE-35 flare dispenser, the AJB-7 bombing system, a GVR-10 vertical gyro, complemented by the VTAS helmet sight worn by the pilot who now sat in a Martin-Baker rocket-assisted, ejector seat that could deploy at zero-height and zero-speed.

The inner wings featured the bulge housing the wider tyres of the main undercarriage wheels introduced on the USAF's F-4C. The main undercarriage was strengthened further to withstand a landing impact of 38,000lb at 23ft per second sink rate. Most significant was the introduction of a slotted leading edge to the stabilators, through cooperation with Hawker Siddeley engineers who had developed the 'blown' tailplane for the Buccaneer. This improved immensely the aircraft's handling, especially at critical low speeds, helping to rotate the nose up during launch or recovery. Working in combination with fixed inboard leading-edge slats and ailerons drooped down 16.5°, approach speed was reduced from 137 to 125 knots.

The F-4J was powered by a pair of J79-GE-10 turbojets rated at 17,900lb – an increase of 2,000lb on the engines fitted to the F-4B – which enable the aircraft to reach Mach 2.2 at 36,000ft. First flight of the F-4J was performed in June 1966. 522 examples of this version were built, delivery beginning on 1 October 1966 and ending in December 1972. Apart from equipping a large number of US Navy units, the F-4J was also in use with the Marine Corps, often referred to as the F-4J(AC), differing mainly in being fitted with a digital AWG-10(A) and retaining the slotted wing.

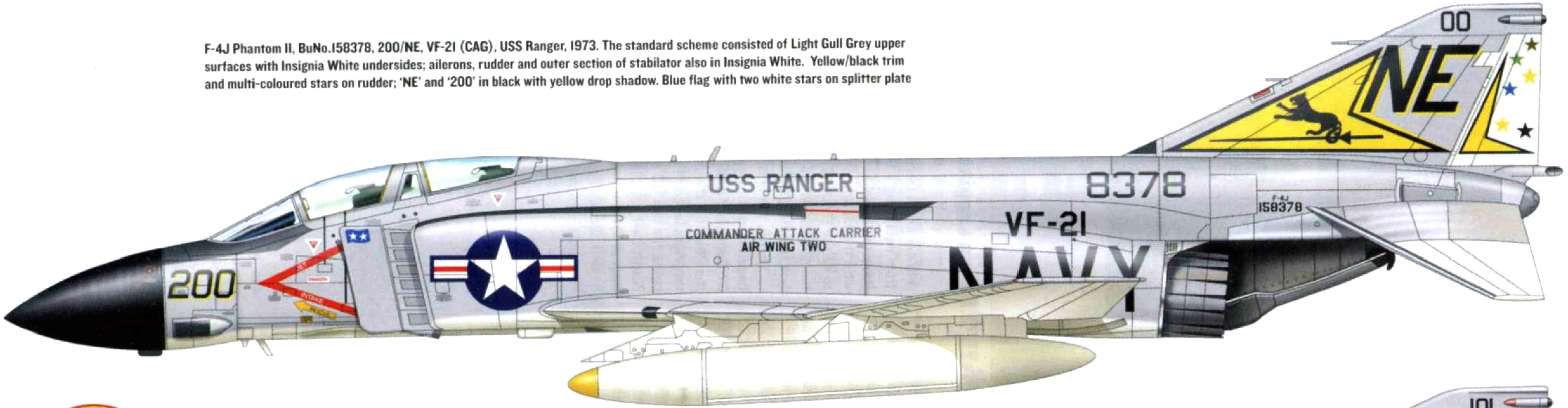
VF-101, the first to receive the F-4J, began re-equipment with the type on 27 December 1966. This version of the Phantom II was also blooded in the Vietnam conflict, Marines F-4Js being the last US aircraft to operate in South East Asia, leaving Nam Phong in August 1973.

Without doubt, the F-4J enjoyed the most colourful career of any Phantom II version, as can be seen from the colour art accompanying this feature. They were also to become the heaviest aircraft to be flown by "The Blue Angels" US Navy aerobatic team. Slightly modified for the task, including the fitting of smoke generating equipment, these F-4Js, resplendent in their deep blue and gold finish, proved not quite adequate for display flying, and eventually the team converted onto A-4F Skyhawks.

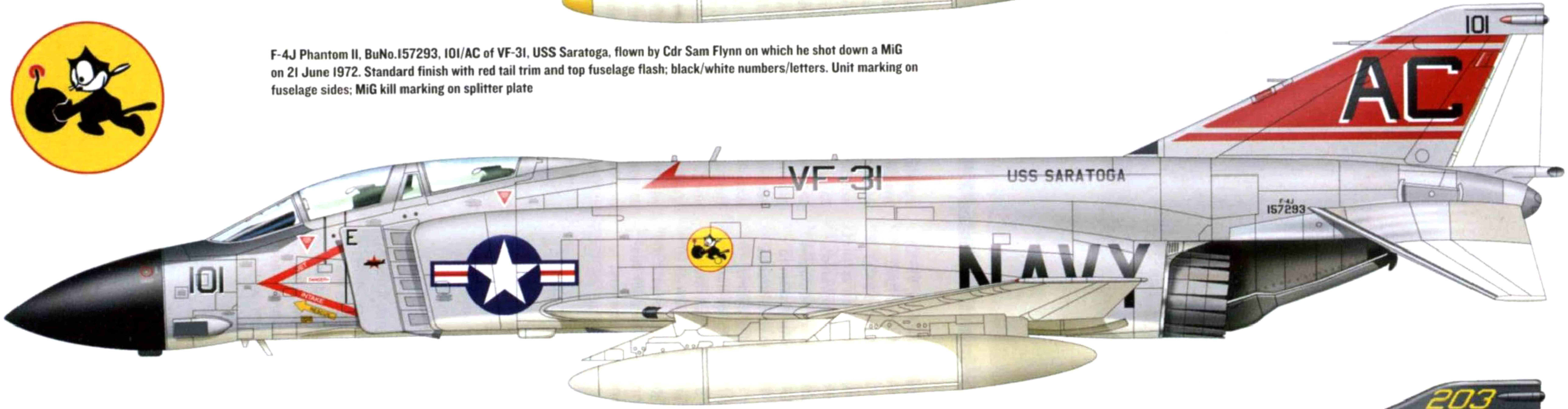
As development continued, the F-4J acquired a number of upgrades and modifications, including the fitting of Sanders AN/ALQ-126 DECM in the form of long, slender fairings above and just aft of the air intakes. Eventually, 248 F-4Js were converted to F-4S standard.

The F-4J was to sire another major variant, the F-4K/M for Britain, the Phantoms used by the Royal Navy (RN) and Royal Air Force (RAF) respectively. But, as the saying goes, that is a completely different story, hopefully to be dealt with in another feature in the not too distant future. ■

F-4J Phantom II, BuNo.158378, 200/NE, VF-21 (CAG), USS Ranger, 1973. The standard scheme consisted of Light Gull Grey upper surfaces with Insignia White undersides; ailerons, rudder and outer section of stabilator also in Insignia White. Yellow/black trim and multi-coloured stars on rudder; 'NE' and '200' in black with yellow drop shadow. Blue flag with two white stars on splitter plate



F-4J Phantom II, BuNo.157293, 101/AC of VF-31, USS Saratoga, flown by Cdr Sam Flynn on which he shot down a MiG on 21 June 1972. Standard finish with red tail trim and top fuselage flash; black/white numbers/letters. Unit marking on fuselage sides; MiG kill marking on splitter plate



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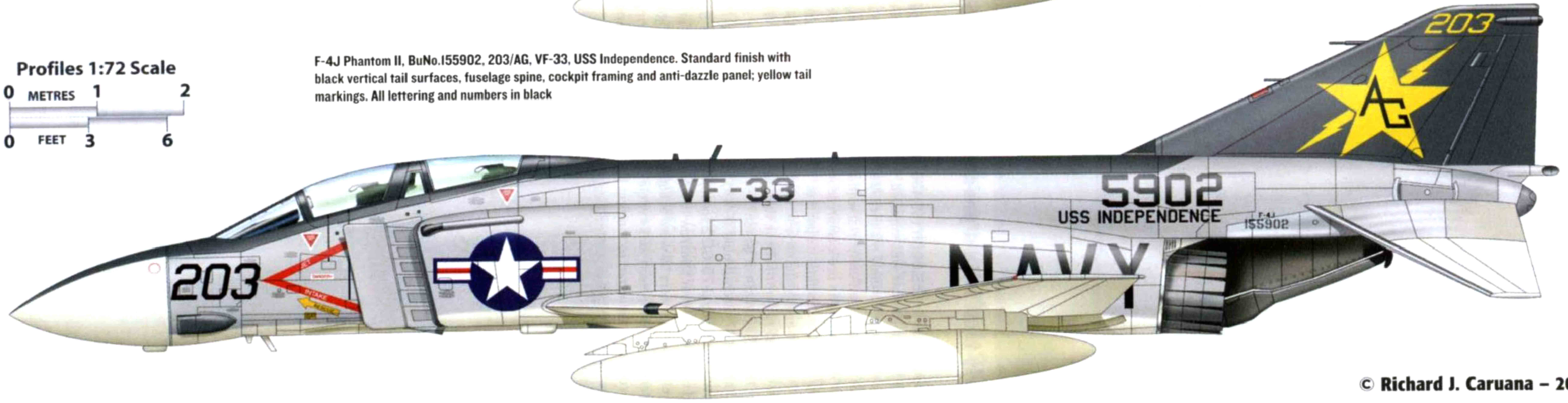
F-4J Phantom II, BuNo.155902, 203/AG, VF-33, USS Independence. Standard finish with black vertical tail surfaces, fuselage spine, cockpit framing and anti-dazzle panel; yellow tail markings. All lettering and numbers in black



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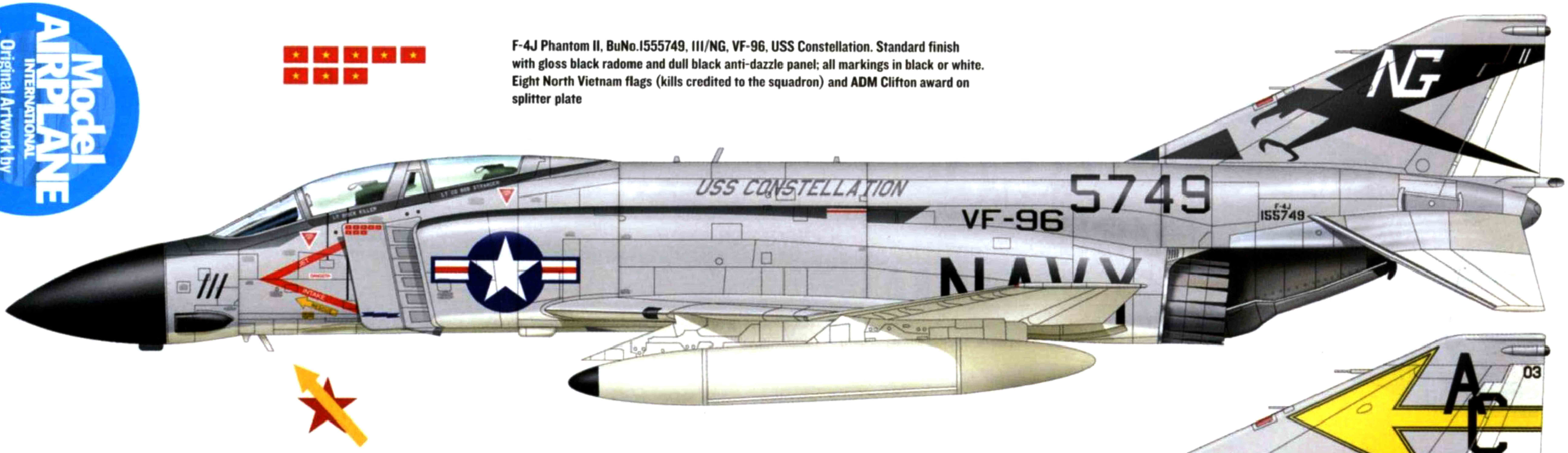
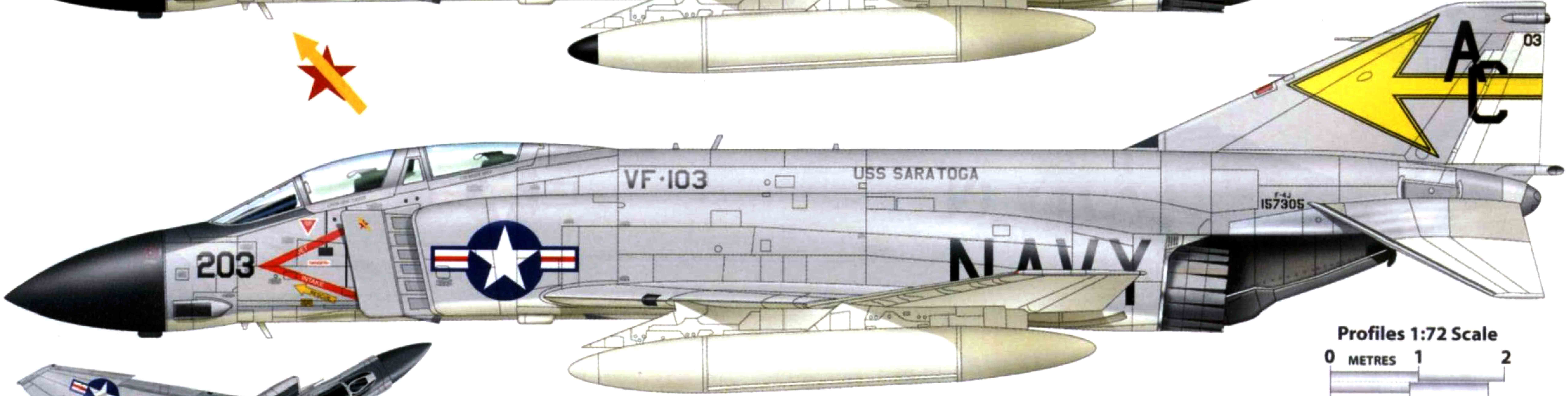
F-4J Phantom II, BuNo.1555749, 111/NG, VF-96, USS Constellation. Standard finish with gloss black radome and dull black anti-dazzle panel; all markings in black or white. Eight North Vietnam flags (kills credited to the squadron) and ADM Clifton award on splitter plate





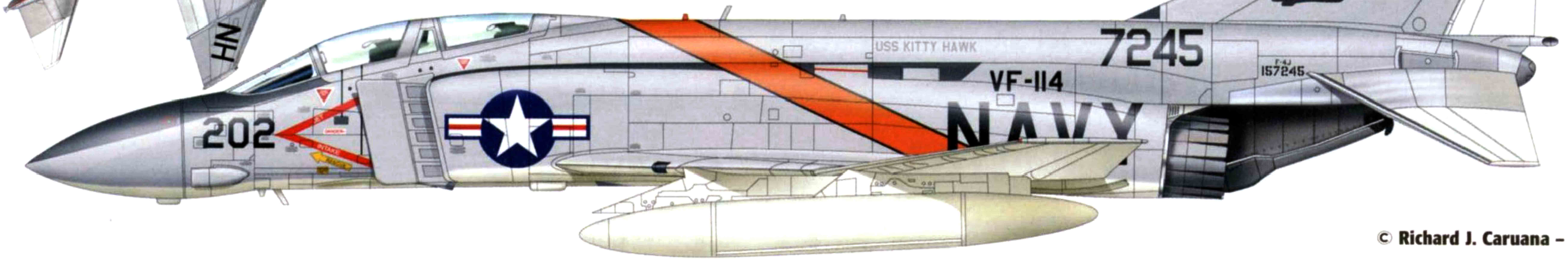
Profiles 1:72 Scale

0 METRES 1 2

0 FEET 3 6

Above: F-4J Phantom II, BuNo.157305, 203/AC, of VF-103, USS Saratoga. Standard finish with yellow/black tail colours; all lettering in black. Kill marking was actually scored by Lt Cdr Gene Tucker and Lt Lg Bruce Eden in BuNo.157299, 206/AC

Below: F-4J Phantom II, BuNo.157245, 202/NH, VF-114, USS Kitty Hawk, 1972. Standard finish with orange/black 'Aardvark' marking on fin and diagonal band on fuselage; orange tip of fin. Black all lettering, numbers and anti-dazzle panel



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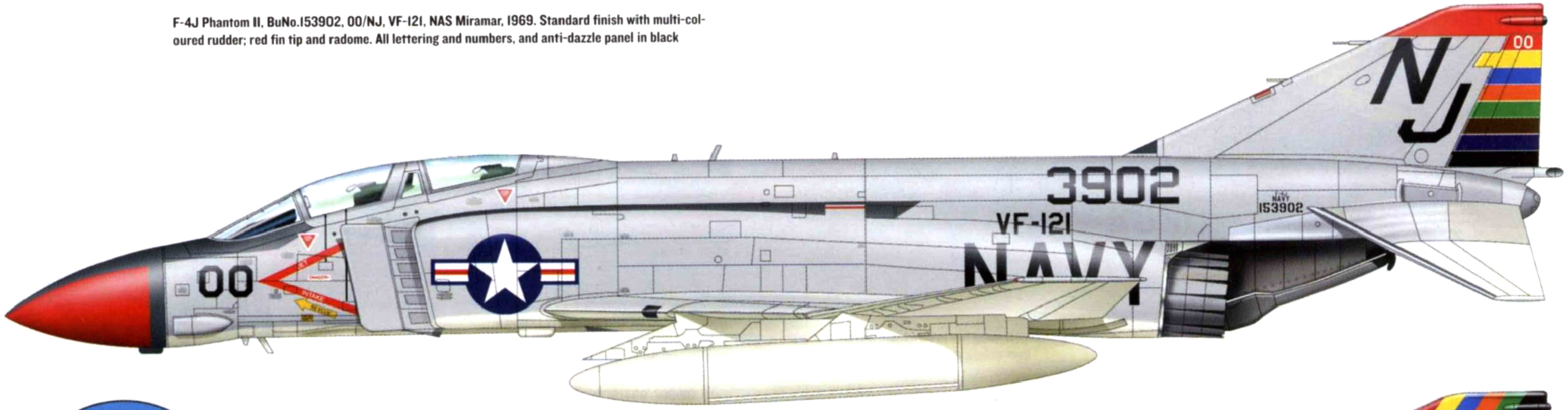
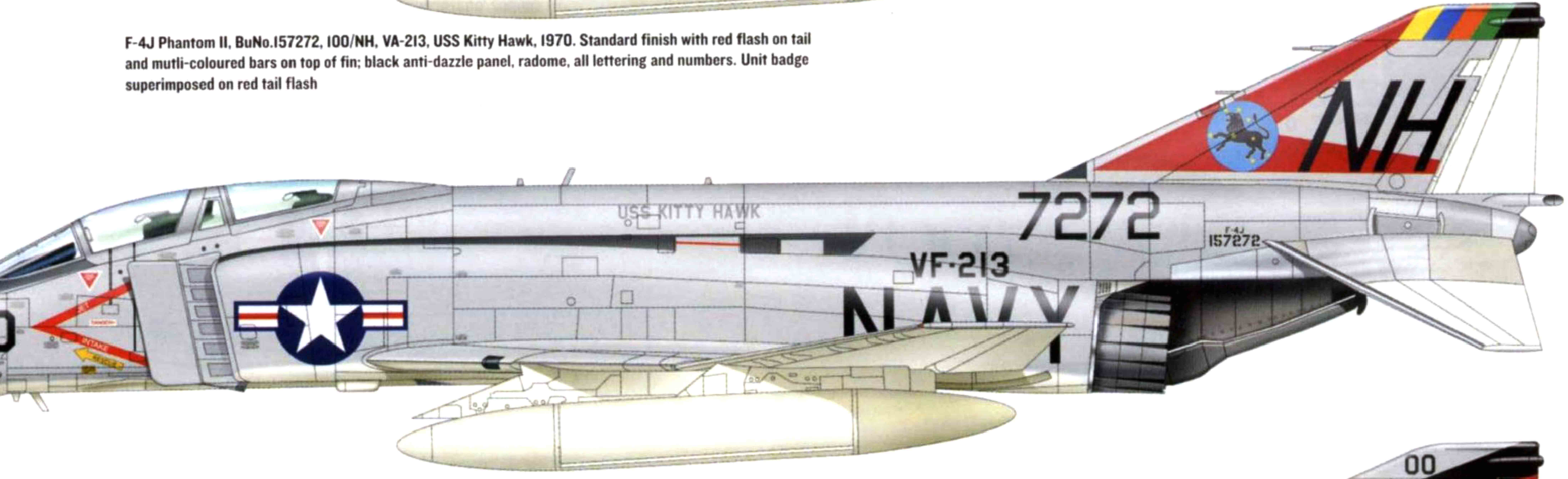
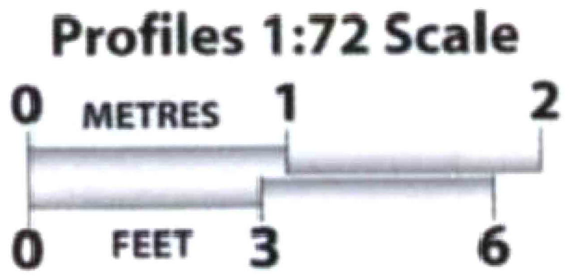
F-4J Phantom II, BuNo.153902, 00/NJ, VF-121, NAS Miramar, 1969. Standard finish with multi-coloured rudder; red fin tip and radome. All lettering and numbers, and anti-dazzle panel in black

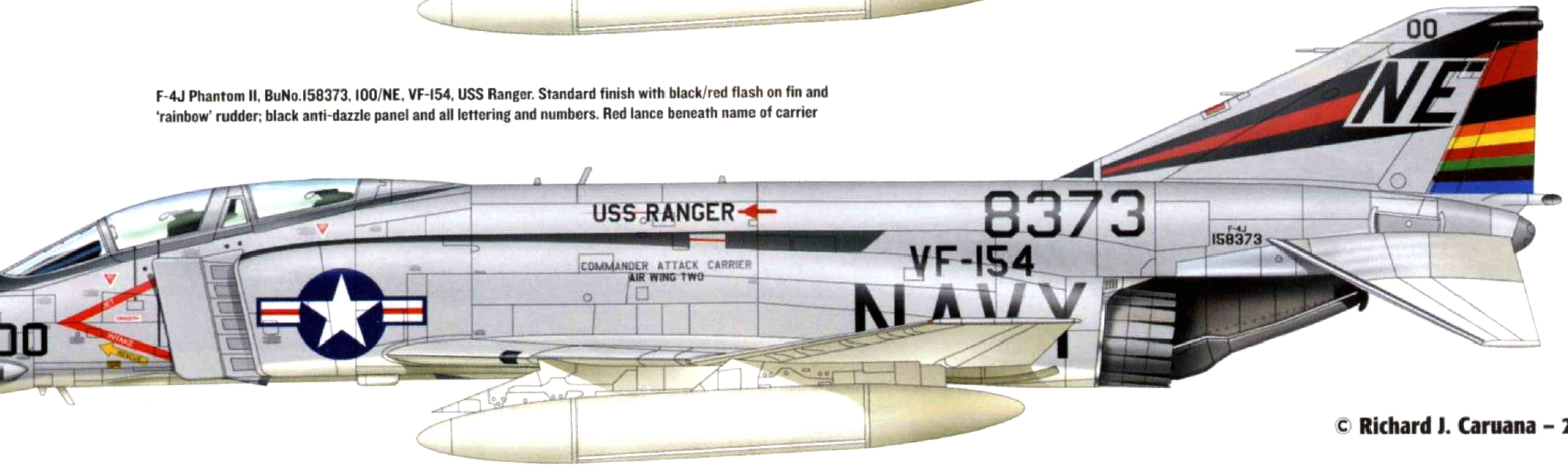


F-4J Phantom II, BuNo.157272, 100/NH, VA-213, USS Kitty Hawk, 1970. Standard finish with red flash on tail and mutli-coloured bars on top of fin; black anti-dazzle panel, radome, all lettering and numbers. Unit badge superimposed on red tail flash





F-4J Phantom II, BuNo.158373, 100/NE, VF-154, USS Ranger. Standard finish with black/red flash on fin and 'rainbow' rudder; black anti-dazzle panel and all lettering and numbers. Red lance beneath name of carrier



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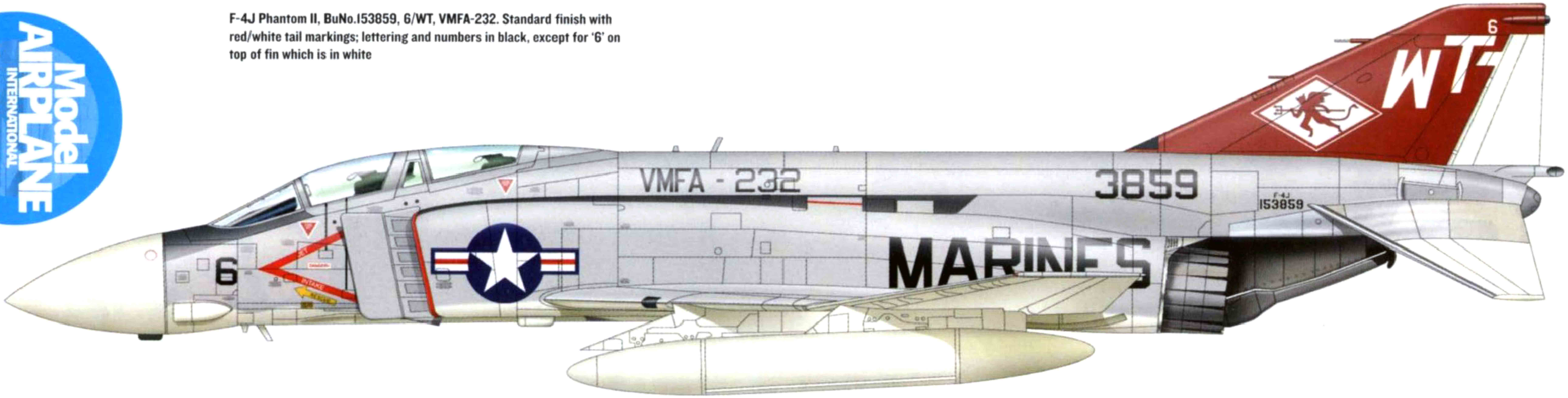
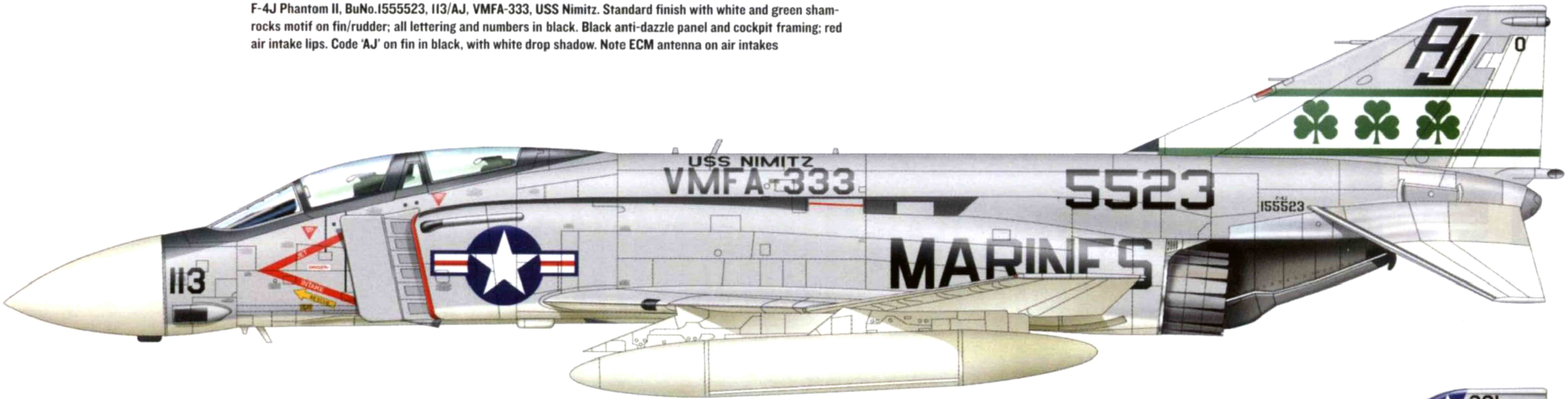
F-4J Phantom II, BuNo.153859, 6/WT, VMFA-232. Standard finish with red/white tail markings; lettering and numbers in black, except for '6' on top of fin which is in white



F-4J Phantom II, BuNo.1555523, 113/AJ, VMFA-333, USS Nimitz. Standard finish with white and green shamrocks motif on fin/rudder; all lettering and numbers in black. Black anti-dazzle panel and cockpit framing; red air intake lips. Code 'AJ' on fin in black, with white drop shadow. Note ECM antenna on air intakes



F-4J Phantom II, BuNo.153776, 201/AA, VMFA-451, USS Forrestal, 1976. Standard scheme with blue nose and cockpit framing, blue/white band around fuselage and blue/white tail markings with unit badge in black and white; all lettering in black except for 1776-1976 which is red/white/blue

Profiles 1:72 Scale

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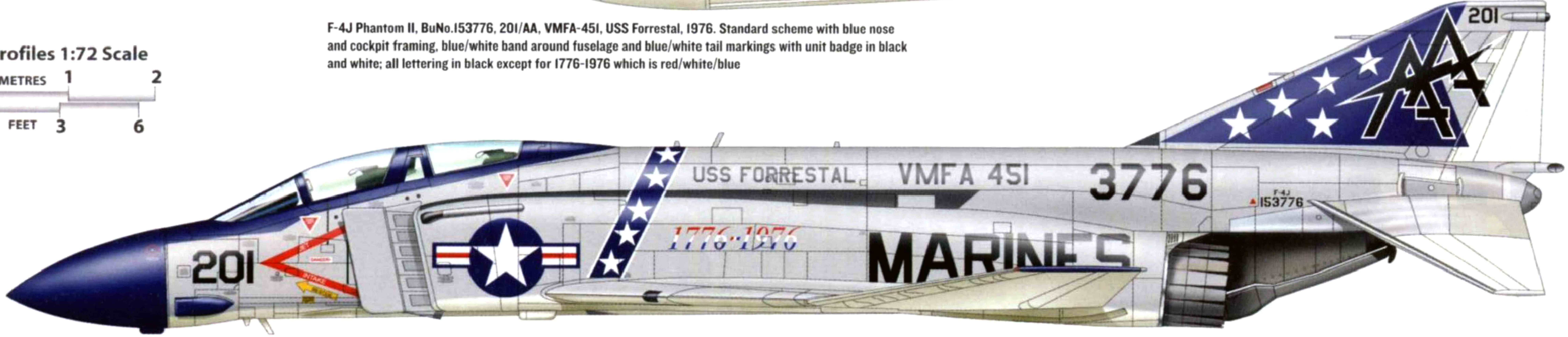

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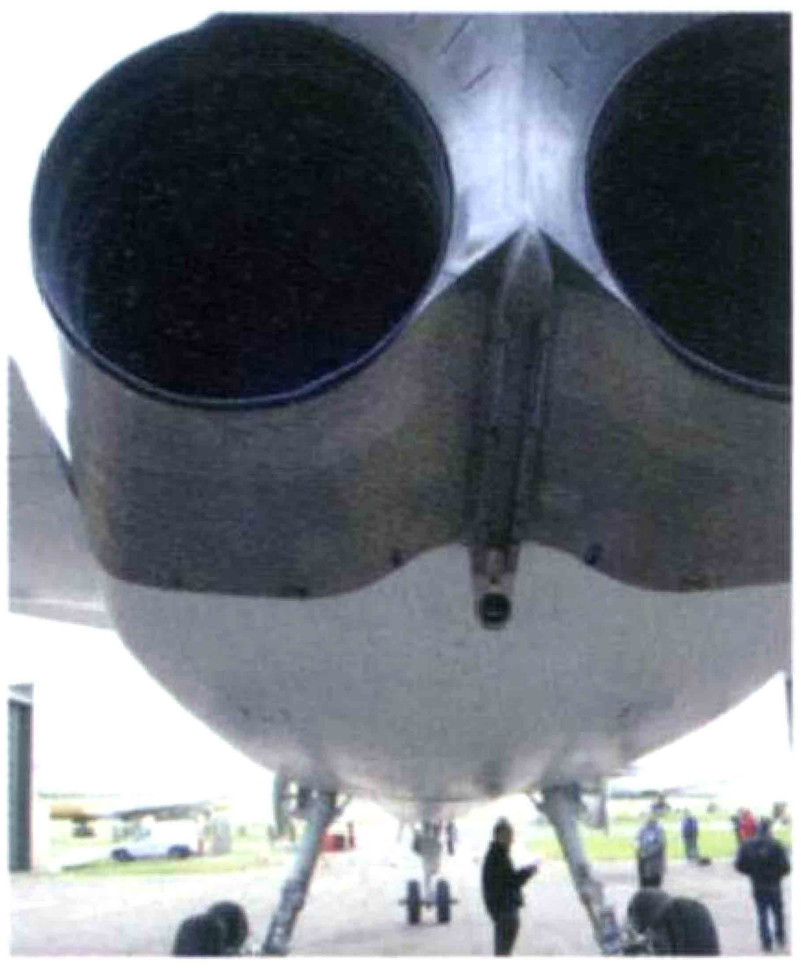
PHOTO ALBUM - TSR.2

All photos © Glenn Sands
Unless stated otherwise

This selection of images shows the TSR.2, XR222, owned by the Imperial War Museum. This aircraft recently underwent restoration for display in the new Air Space Museum soon to open at Duxford and Glenn photographed it during the official roll-out ceremony on the 16th December 2005

Close-up of one of the mainwheels

The nosewheel assembly and tyres



Viewed directly from behind here you can see the exhaust cans projecting slightly aft of the unpainted tail cone and the connection between the engines for the braking chute

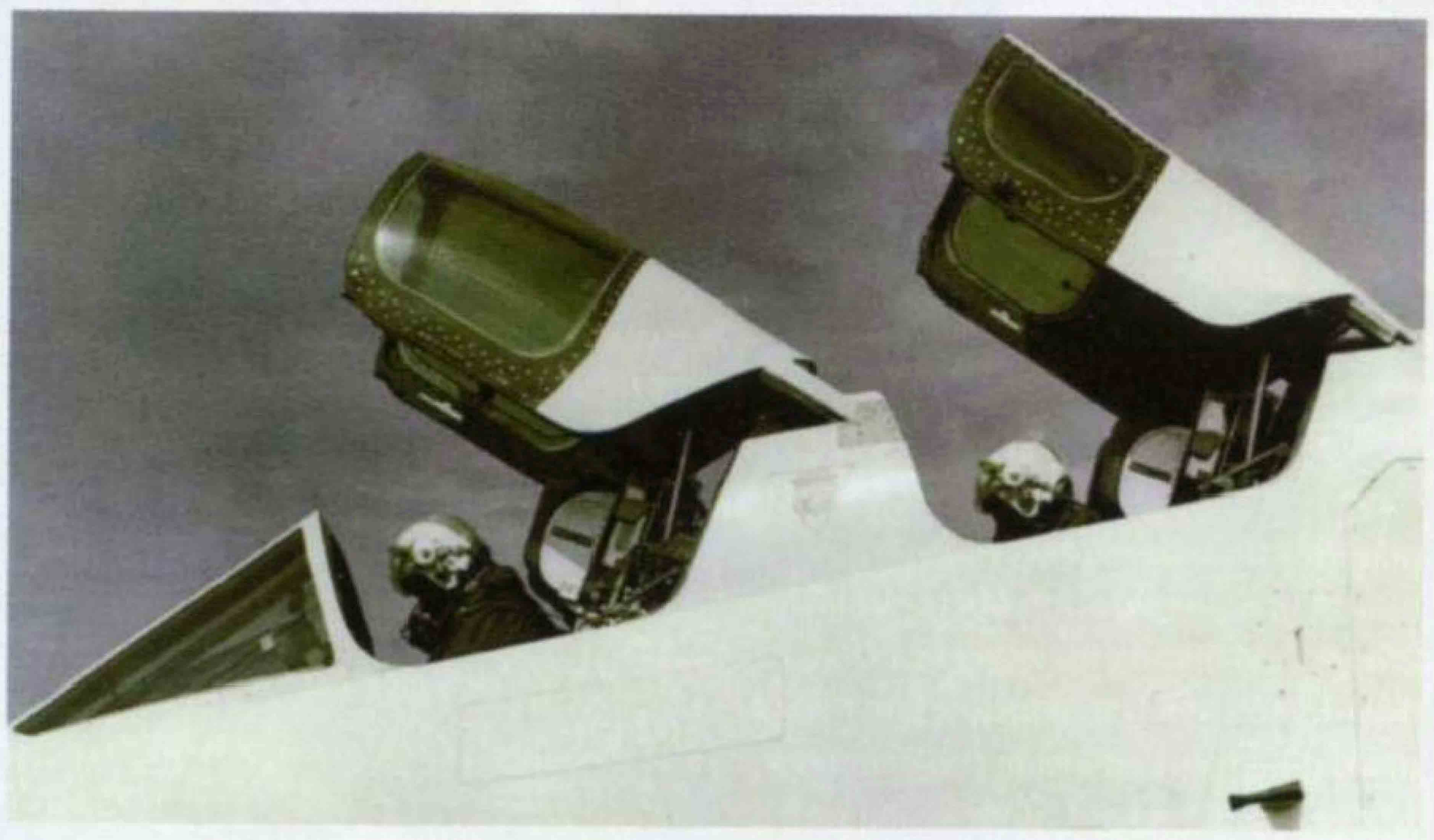
A close look into the starboard intake. The little spacers at the bottom and top connecting it to the fuselage side and the way the shock cone slots into the inner element resulting in a gap are all very helpful

A useful view up under the inboard flaps of the starboard wing, for any of you intending to drop these on the Airfix kit!

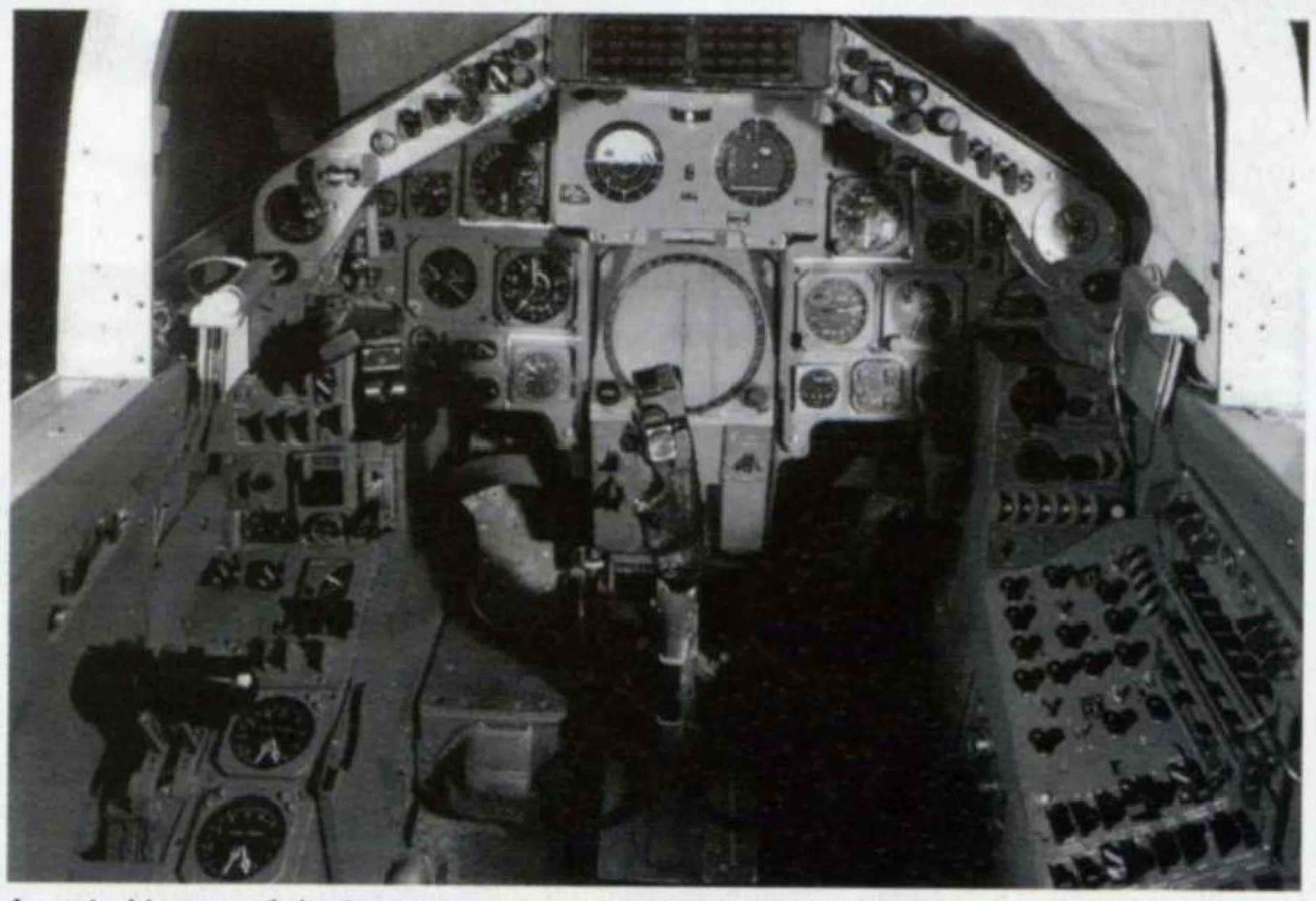
The main undercarriage bogie and wheels viewed from the outboard

It is difficult to see on a white airframe, but you can see the profile of the underside of the wing. This is a point that the Airfix kit seems to have got wrong

An unusual view underneath and looking backwards. The various access panels, gear and bomb bay doors are all visible as are the two little vent pipes forward, and either side of the undercarriage bays

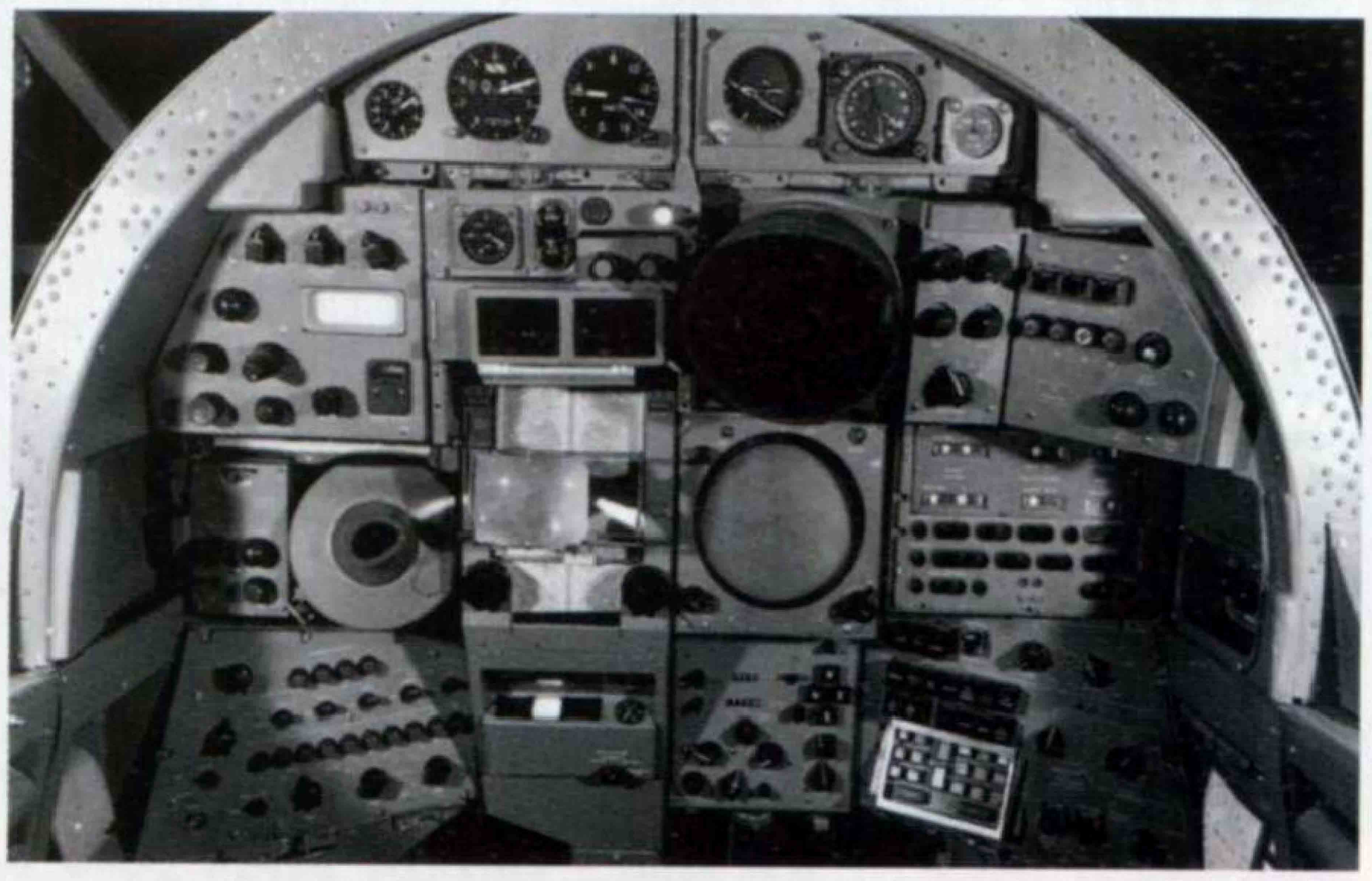


This period shot of the TSR.2 while being test flown . Note the profusion of screw heads visible on the black canopy surround, the bare-metal areas by the canopy hinges and the venturi tube on this side of the fuselage. The windscreen also seems to be tinted in the same way as the canopy sections



A period image of the instrument panel and side consoles in the front cockpit (©BAC)

Inboard view of the main undercarriage bogie



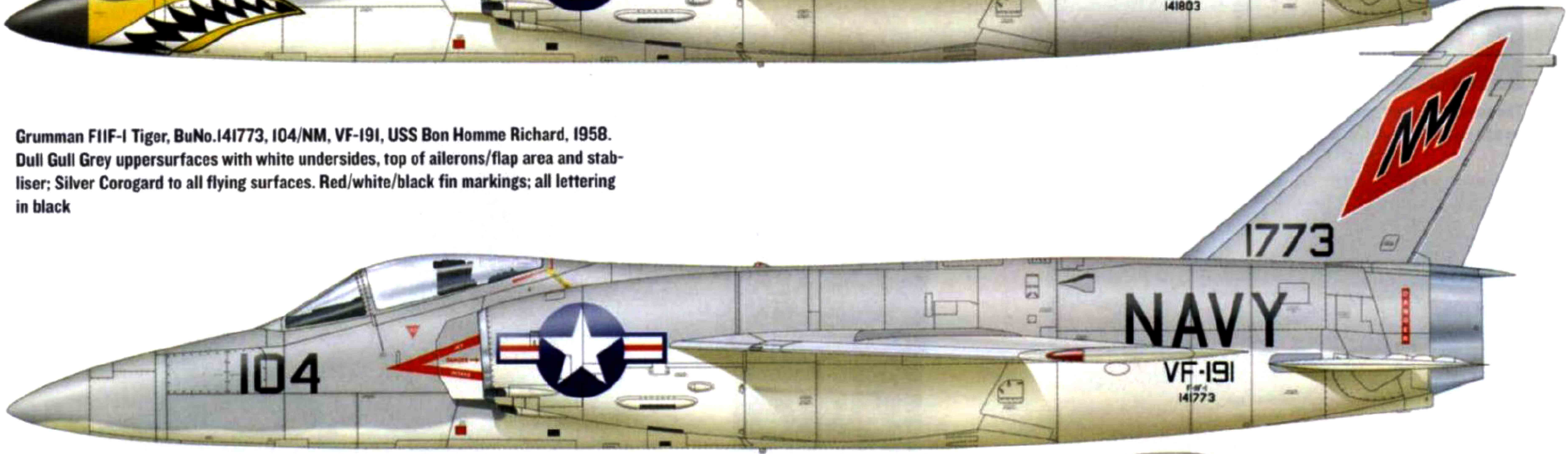
A similar period shot of the rear cockpit area (©BAC)

The intake viewed from the starboard side. The stressed skinning is nicely highlighted in the early morning sun, as are the two intake bleed doors. You can also get a feeling for the correct profile of the wing and its leading-edge from this shot

The top of the nosewheel oleo and associated linkage viewed from the back, looking forward

Grumman F11F-1 Tiger, BuNo.141803, 204/AM, VF-21, USS Ranger, 1957. Dull Gull Grey uppersurfaces with white undersides, top of ailerons/flap area and stabliser; Silver Corogard to all flying surfaces. Yellow/black bands around tail; yellow/white/black 'sharkmouth'. All lettering in black

Grumman F11F-1 Tiger, BuNo.141773, 104/NM, VF-191, USS Bon Homme Richard, 1958. Dull Gull Grey uppersurfaces with white undersides, top of ailerons/flap area and stabliser; Silver Corogard to all flying surfaces. Red/white/black fin markings; all lettering in black



Grumman F11F-1 Tiger, BuNo.141811, AF/202 of VF-33 'Astronauts', USS Intrepid, 1957. Dull Gull Grey uppersurfaces with white undersides, top of ailerons/flap area and stabliser; Silver Corogard to all flying surfaces. Yellow/black trim with 'AF' on fin thinly outlined in yellow; all lettering in black. Combat ready pennant in red above national marking on air intake; 'Astronauts' in black below unit badge

The upper view shows marking details for AF/202, however it is basically standard for United States Navy F11F-1 Tigers wearing this scheme

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Grumman F11F-1 Tiger, BuNo.141849, '4', Blue Angels aerobatic team, Pensacola, 1965. Gloss Dark Blue overall with yellow trim above and below fuselage, wing and tail tips, and all lettering; Silver Corogard to leading edges of all flying surfaces and upper wing root areas. Note pilot's name under cockpit. Views below show upper and lower surface marking details

Grumman F11F Tiger, BuNo.141792, 3H/350 of VT-23, US Navy. Dull Gull Grey upper surfaces and white undersides with orange nose, vertical tail surfaces and wingtips; black lettering and anti-dazzle panel

Grumman F11F Tiger, BuNo.141864, 303/3L, of VT-26, US Navy, Chase Field. Gull Grey upper surfaces and Insignia White undersides with orange nose, vertical tail surfaces and wingtips; leading edges of flying surfaces silver. All lettering and anti-dazzle panel in black

THE BRISTOL BEAUFORT

(With Special Historical Reference to Operations in the Mediterranean)

BUILT & WRITTEN BY
RICHARD J. CARUANA

Banking sharply to the right, Beaufort Mk I, X8931, L2•, belongs to No. 3 Operational Training Unit. Note the characteristic chin turret, very similar to that adopted for the Blenheim Mk IV
(© R.J. Caruana Archives)

Detail shot of a Beaufort Mk I, DD959, •Q from No.217 Squadron during its service from Luqa. It was lost during a shipping strike on 20th June 1942
(© R.J. Caruana Archives)

Loading a 'tinfish' into the bomb bay of a Beaufort at Malta. As can be noticed, the torpedo did not fit completely into the bomb bay and was carried semi-exposed
(© R.J. Caruana Archives)

Highly successful in most roles accorded to it, in numerous theatres of operations during the Second World War, the Bristol Beaufighter owes much its genesis to the lesser-known Beaufort. The latter was, in itself, also derived from a previous important Bristol design, the Blenheim.

During the formulation of plans for the expansion of the Royal Air Force (RAF) in the mid-thirties, special attention was given to the role of the torpedo-bomber, which with a single blow could sink an enemy ship by launching a suitably modified torpedo from the air. Consideration was also given to the importance of aerial reconnaissance around Britain's coastline so that it could be kept clear of enemy ships and submarines. Up to that time the Vickers Vildebeeste and Avro Anson had respectively been carrying out these two roles. While the latter could lay some claim to modernity, being a monoplane, the former was a biplane of basic design dating back to 1930.

In September 1935, the RAF issued Specification M.15/35 calling for a new twin-engined land-based torpedo bomber, and Specification G.24/35 for a four-seat general reconnaissance aircraft. Needless to say, these specifications laid great importance on the need for the new aircraft to display a considerably higher performance and load-carrying capability than those they were intended to replace in service. Avro, Blackburn and Bristol were the only three aircraft manufacturers to respond to these requests. The first proposed an Anson derivative for the G.24/35 specification, powered by a pair of Armstrong Siddeley Terrier engines, under the designation of Type 672. Blackburn was obviously interested in the other request, due no doubt to its previous experience in producing torpedo-bombers (e.g. Dart, Ripon and Shark).

Bristol approached these specifications from a different angle. Although it had no experience in the production of aircraft in either of these roles, it knew well that the Blenheim – that had just been ordered into production – could serve as an excellent basis to meet both requirements. Toward the end of 1935, the company submitted two separate proposals, Type 149 in response to G.24/35 consisting of a suitably modified Blenheim having a wider fuselage to provide accommodation for four crew members, and Type 150 to cover M.15/35 whose fuselage was extensively modified so that a torpedo could be carried inside the bomb bay. Both designs featured the short, unstepped nose of the Blenheim Mk I.

Shortly afterwards, Bristol suggested that due to the similarity between Types 149 and 150, the two could be integrated into one design project designated Type 152. Fully detailed proposals in this regard were submitted in April 1936, providing accommodation for three crew members for either role. Power was to be supplied by a pair of Aquila AE-3M or Perseus VI engines, though it was estimated that the latter would provide a better overall performance. The torpedo was to be carried partially inside the bomb bay, the lower half remaining exposed.

The Air Ministry seems to have welcomed this suggestion and drew up Specification 10/36 around Bristol's Type 152. While the semi-recessed torpedo arrangement was accepted, officialdom continued to insist on a four-man crew. L.G. Frise's design team acted accordingly and raised the fuselage between the pilot's cockpit and dorsal turret. A decision was taken to dispense with the need of prototypes and both Bristol and Blackburn designs, intended to be powered by the 850hp Perseus engines, were ordered into production off the drawing board so as to speed up their introduction into service. Bristol's design received the name 'Beaufort' while Blackburn's B.26 was given the name 'Botha'.

Bristol's first contract, issued on 22 August 1936, covered 78 aircraft (L4441-L4518), the first five of which were to be retained for trials and development tasks at the Aircraft & Armament Experimental Establishment (A&AEE), the Torpedo Development Unit (TDU) and the Central Flying School (CFS). In view of the poor performance estimates expected from the Perseus engines, it was decided to power these aircraft with the two-row Bristol Taurus then still under development. It was planned that production aircraft would be powered by the Taurus Mk II or Mk III (fully supercharged), expected to produce 1,010hp, for which Bristol's engine division also designed a special close-fitting cowling.

Initial ground running of these engines, however, presented cooling problems and the cowlings had to be redesigned to incorporate conventional cooling gills. L4441 took to the air for the first time on 15 October 1938, piloted by Cyril Uwins. On 17 April of the following year the aircraft had been transferred to Martlesham Heath (A&AEE) for three weeks of handling trials. The second Beaufort, L4442, flew shortly after L4441's first flight and was retained for manufacturer's development flying. L4443 was officially handed over to the RAF in May 1940, being lost the following month at Filton while undergoing engine cooling development trials. Since L4444 had been earmarked for the CFS, it was fitted with dual controls; L4445 went to the TDU for weapons' dropping trials.

INTO PRODUCTION

Production standard Beauforts (L4446 onwards) began to leave Filton's line on 24 November 1939. The first few examples were passed on to No. 22 Squadron, on whom fell the onus of preparing the new aircraft for service through a series of intensive trials at Thorney Island. Partly through inexperience of the crews and partly through engine problems, the squadron suffered a number of losses, thankfully not all with fatal consequences.

The supercharged Taurus III was originally fitted as standard, although it was later believed that the Mk II would be more suited to the low-level role of the Beaufort. Eventually all Mk III-engined aircraft were returned to Filton during the first half of 1940 to be fitted with a modified Mk III engine designated Mk IIA; new aircraft were, meanwhile, being fitted with the Taurus Mk VI which was similar to the Mk II but specifically designed for the Beaufort. Originally the RAF had designated Taurus Mk III-powered aircraft as Beauforts Mk I, while those powered by the Taurus Mk II were designated Beauforts Mk II. With the appearance of the Taurus VI it was decided that all Taurus-engined Beauforts were to be known as Mk I while the designation of the Mk II was reserved for the Twin Wasp-powered aircraft, as related later.

Production of the Beaufort soon began to pick up, though at first it suffered slightly due to an increase on the Blenheim line at Filton. Building of the aircraft by Blackburn had also been considered at one time, although this did not materialise.

AUSSIE BEAUS

A British Air Mission visiting Australia in January 1939 was investigating the possibility of producing aircraft for the RAF and the Royal Australian Air Force (RAAF) in that country, and by March the Beaufort had been chosen for this project. The Department of Aircraft Production (DAP) was established to control the Beaufort Division. Seen as a major challenge by standards of the embryonic Australian aircraft industry, success depended largely on diversifying as widely as possible the production of components by sub-contracting out to some 600 small workshops, while seven factories handled the major sub-assemblies. These were then to be sent to the main assembly lines at Fisherman's Bend and Mascot.

The eighth production Beaufort (L4448) built at Filton was shipped to Australia for trials and to be used as a pattern together with a set of parts for 20 examples. Re-serialled A9-1001, it had its Taurus engines replaced by 1,200hp Pratt & Whitney (P&W) Twin Wasps. As early as July 1939, an order for 180 examples had been placed; half of these were earmarked for the RAAF and the other half were to be delivered to the RAF's Nos 36 and 100 Squadrons in Singapore.

All performance expectations of the P&W-powered 'prototype' (T9540) were exceeded and as from May 1941 several long-distance flights had been carried out. By August of that same year, the first DAP Beaufort had started its flight test programme. Only six Beauforts from the first run of Australian production reached Singapore before the rapid advance of the Japanese forced the British to withdraw early in 1942. It was therefore decided that all 180 examples were to be taken over by the RAAF.

INTO SERVICE

Meanwhile, back home the initial contract for 78 Beauforts had been increased to 350, with production at ➤

"On 10th June 1942, twelve Beauforts of No.217 Squadron were 'requisitioned' by AOC Malta on the basis that the groundcrew party were not due to arrive in Ceylon before August!."

Filton reaching a peak of 30 aircraft per month during March 1940, barely five months after having started. To make up for the loss of the 90 DAP Beauforts, the RAF requested the same number from Bristol, the last five of which were to be built as Mk IIs powered by the P&W.

This was followed by an order for 165 Mk IIs, the first of which (N1110) served as prototype flying with the American engines in November 1940. Eventually production of the Mk I totalled1,014 aircraft. Production of the Mk II got under way in July 1941 with the first example being delivered to the RAF on 10 September. The Twin Wasps, driving fully feathering Curtiss Electric propellers, improved the aircraft's take-off and single-engine performance. Above all it relieved pressure on Taurus engine production while at the same time providing the aircraft with greater reliability. Two guns replaced the single Vickers in the Daimler dorsal turret. 166 examples of this version were built, production ending in 1943 with ML722.

No 22 Squadron that had been working up with the type as early as January 1940 at Thorney Island, moving to North Coates in April. It had been established that the Beaufort's bomb bay was ideal for carrying mines. On the night of 15/16 April, No 22 flew nine Beauforts on their first operational sortie, laying mines in the Schilling Roads just north of Wilhelmshaven in response to the German invasion of Denmark and Norway. One aircraft failed to return. On the night of 17/18 April, the squadron performed its first bombing mission. The aircraft could carry four 250lb or two 500lb bombs, and on many occasions was deployed on anti-shipping sorties in the Skagerrak and against bases in Norway. The Beaufort's low flying and cumbersome performance made it an easy target for enemy fighters and ground defences, causing heavy losses to both aircraft and crews.

No 42 Squadron began to receive Beauforts in May 1940, having moved to Wick in Scotland. Engine problems had, by that time, become so acute that the type had to be grounded until August. The only exception was when nine Beauforts from this squadron were allowed to bomb the Scharnhorst off the Norwegian coast, after it had been damaged by torpedoes fired from the submarine HMS Clyde. This inconclusive raid cost the RAF a high price: three aircraft shot down by Bf 109s flying from Norway.

The first torpedo-bombing mission was performed by No 22 Squadron on 11 September 1940, after problems with the engines had been largely solved. Five Beauforts attacked a convoy off Ostend, hitting a 6,000-ton vessel. The third RAF unit to fly the type was No 86 Squadron based at North Coates, soon followed by No 217 at Thorney Island. No 22 moved to St Eval from where it launched a torpedo attack against the Gneisenau in the harbour of Brest on 6 April 1941. Fg Off Kenneth Campbell was awarded a posthumous Victoria Cross (VC) after pressing home his attack in the face of an intense barrage, crippling the ship that remained out of action until the end of that year. This was the first aerial VC to be awarded during World War II. But such a heroic action was only the preview of what Beaufort crews were to face.

During the later months of 1941, No 415 (Canadian) Squadron and No 489 (New Zealand) Squadron began their conversion onto the Beaufort at Thorney Island.

MAST HIGH IN THE MED

While the continuous Axis bombardment of Malta did not seem to reach the enemy's aim, that of subduing the Island into surrender, an enormous effort was made to try to cut off its supplies, starve the population and reduce its offensive and defensive capacity. By June 1942, this situation had reached alarming proportions and Beauforts of No 217 Squadron were flown to Luqa to provide cover for convoy operations.

Two convoys were despatched to the Island, Operation Harpoon from Gibraltar and Operation Vigorous from Alexandria, in the hope that one might manage to run the gauntlet. However, the state of No 217's aircraft and the inexperience of its crews left much to be desired. By 13 June, the scheduled arrival date of the first convoy, only nine aircraft had been rendered serviceable.

On 10 June 1942, twelve Beauforts of No 217 Squadron passing through Luqa in transit to the Far East were 'requisitioned' by the Air Officer Commanding Malta (AOC) on the basis that the groundcrew party were not due to arrive in Ceylon before August! They immediately went into action against enemy shipping sailing between Tripoli and Southern Italy, supplying the Afrika Korps. While attacking a heavily escorted enemy convoy on 21 June, the squadron lost three of its aircraft.

Five Beauforts from No 39 Squadron arrived in Malta the following day, and on 23 June joined those of No 217 in joint operations against an enemy convoy escorted by two destroyers which had been sighted at Punta Silo, Italy's south-eastern tip. A very hot reception awaited the Beauforts resulting in the loss of two of their number. However, two cargo ships had been successfully hit. Their damage was such that they had to turn back to Taranto to unload their cargo.

On 3 July, a morning sortie failed to locate the same convoy that had, by that time, set sail with fresh vessels. No 39's Commanding Officer (CO), Sqn Ldr Pat Gibbs, led three of his squadron's Beauforts, together with three others from No 217, for another try at dusk. The interception this time was successful, the enemy ships being sighted at extreme range. One of the ships was hit and had to make for a Greek port but during this action two Beauforts were hit by return fire. One of these was the aircraft flown by Gibbs himself, who just managed to nurse it back to base. A curious

Beaufort Mk I N1172, AW•S from No. 42 Squadron. This aircraft was forced to ditch after being hit during a shipping strike in the Skaggerak on 8th April 1942 (© R.J. Caruana Archives)

incident occurred on 28 July when a 217 Squadron crew were forced to ditch their aircraft at sea. They were picked up by an Italian Cant Z.506B and flown to Greece. On their flight to Taranto from Greece, the 'Commonwealth' crew (made up of one British, one South African and two New Zealanders) overpowered their guards and hijacked the Italian aircraft back to Malta!

By August 1942, No 39 Squadron had been practically wiped out and it was decided to replenish the unit with the remaining aircraft of No 217. More Beauforts arrived from No 86 Squadron, the residue of the parent unit in Egypt forming No 47 Squadron there. This enabled No 39 to be reborn as a full-fledged squadron, with 20 aircraft on strength, 16 of which were fully serviceable.

These strikes by Malta-based Beauforts, aided by Beaufighters, were hitting Rommel where it hurt most, in his mobility as supplies – particularly fuel – became scarcer. One of the most notable missions flown by No 39 Squadron was flown on 6 September when a 10,000-ton vessel was sunk and a 6,000 ton-ship was beached; one of the Beauforts even managed to shoot down a Macchi C.200. All this was achieved at a cost: two Beauforts shot down, and four badly damaged which barely made it back to base.

No 39 flew its last significant operation on 22 September when an enemy tanker was hit south of Corfù. Dilapidated, the unit was withdrawn to Egypt on 1 October to be restructured only to be called back to Luqa a week later. The unit was back in action on 12 November, though ten of the Beauforts were ordered to leave for Shallufa (Egypt) on 9 December.

Back to Malta on 21 January 1943, the unit began to undertake mine-laying missions apart from its usual duties. No 39 scored a notable success with the sinking of the 9,500-ton Throsheimer on 21 February with the launch of four torpedoes. This action deprived Rommel of 5,400 tons of fuel, half the total fuel loaded for North Africa during that month. At the end of March, No 39 Squadron finally left Malta for Heliopolis.

AUSTRALIAN VERSIONS AND EXPORTS

Following the Allied landings in Sicily, Malta was secure and the need for Beauforts in this region diminished. The aircraft was now set for use in India and Ceylon.

The first Australian unit to be formed with the Beaufort was No 100 Squadron in February 1942, reaching operational readiness in June at Cairns. Its first operational mission, using Port Moresby as an advanced base, took place on 25 June attacking Japanese shipping off the New Guinea coast. No 100 flew the first RAAF Beaufort torpedo-bombing attack on 7 September.

First 50 Beauforts of Australian production were designated Mk V, and were powered by Twin Wasps built by General Motors-Holden Ltd in that country. The Beaufort Mk VI consisted of a batch of 40 examples powered by imported P&W R-1830-S1C3G engines driving Curtiss propellers, while 60 Mk VIIs had similar engines but with Hamilton-Standard props. These were followed by 30 Mk VA powered by locally-built engines and Hamilton-Standard propellers. The definitive Australian version, the Mk VIII, of which 520 were ordered, featured GM-Holden Twin Wasps driving Curtiss Electric props, British ASV radar, Bristol Mk BI or Mk V dorsal turret (replaced by the Mk VE turret with twin 0.50in guns on the last 140 examples), and enlarged fuel tankage. Moreover all Australian-built Beauforts featured an enlarged fin area, introduced on the 91st production machine and fitted retrospectively to those previously built.

Nos 6 and 8 Squadrons RAAF were next to fly the type while some Beauforts were also delivered to Nos 7 and 14 Squadrons flying Hudsons. Final version of the DAP Beaufort was the Mk IX, basically a transport model with dorsal turret removed and its area faired over. The first of 46 examples appeared late in 1944. Probably the least glamorous task assigned to the Australian Beauforts was that of spraying insecticide to combat the great locust plague of 1947.

The Beaufort did not enjoy the export success of its other stablemates – the Blenheim and Beaufighter. 18 Beauforts were passed on to the South African Air Force (SAAF), for use by No 16 Squadron. Plans to introduce the type in Canada were unsuccessful, although 149 Squadron was formed with 12 Beauforts. The only other user was Turkey, which received a batch of 13 Mk IAs and 12 Mk IIs during early 1945. It is believed that these were the last Beauforts to remain in service, being declared surplus in 1950.

COMBAT REPORT

This is a vivid and colourful description of what it was like for a crew member of a Beaufort operating from Malta. It is a direct transcription from a combat record of the period:

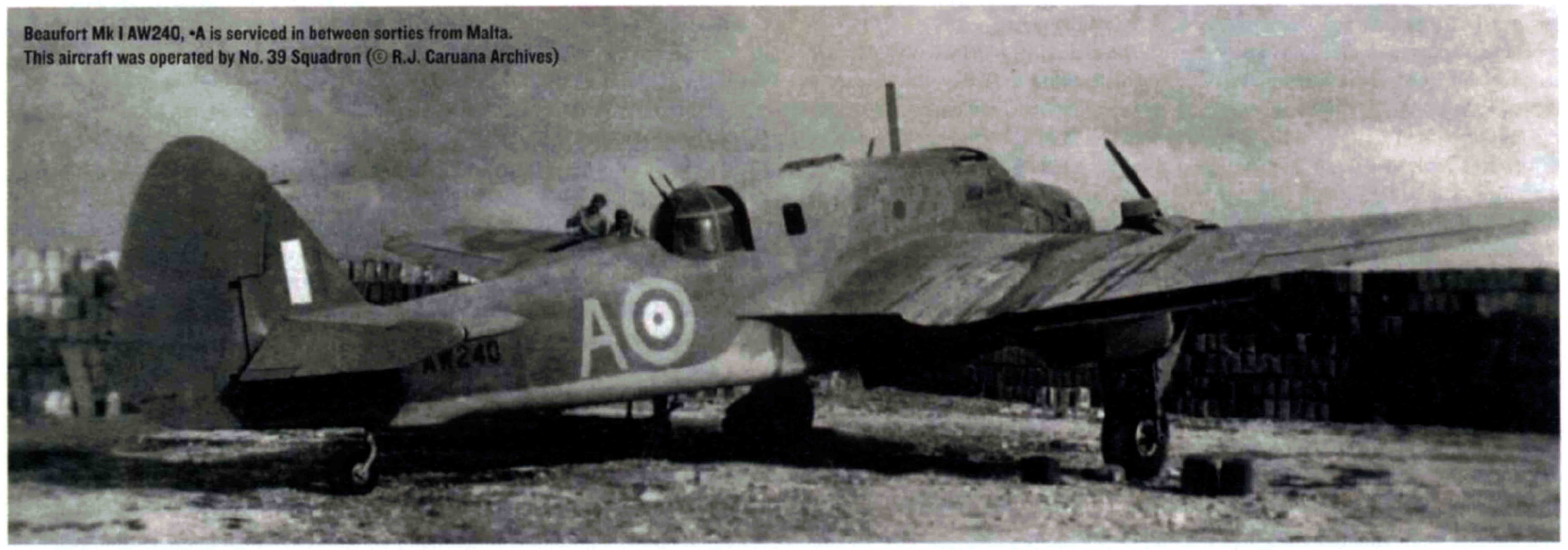
"17th August: Six crews set out to prang one motor vessel and two destroyers south of Pantelleria. A successful operation, as the 6,000-ton MV was left well down in the water, with smoke pouring out of it. One observer, who was wounded, had to extinguish a fire in his navigator's bag.

"21st August: Nine Beauforts attacked a 10,000-ton tanker (with escort of five destroyers) near Corfù. Three hits claimed, and Beaufighters hit a destroyer with bombs. The tanker appeared to be stationary when last seen, and was emitting steam. Subsequent reconnaissance showed her beached, with a large patch of oil on the sea. Wellingtons tried unsuccessfully to ignite this oil with fire bombs. One crew lost. Beaufighter escort destroyed one Ju 52, two Piaggio [Fiat] 32s and two BR.20s.

"26 August: Nine Beauforts attacked one MV of 6,000 tons escorted by one destroyer north of Benghazi. One torpedo broke the ship's back, and subsequent hits set her ablaze from stem to stern. Escorting Beaufighter destroyed a Cant.

"30th August: Nine Beauforts attacked a 5,000-ton tanker and one destroyer south-bound from Taranto. The CO's torpedo was seen to hit. A second hit caused the tanker to blow up and burn furiously. Superstructure was thrown high in the air. One pilot's prize moustache was endangered when he performed a 'fly through fire' act at something like 250 feet. One Cant Z.501 was flying above the ship. There followed an example of mob violence of unequalled ferocity. All the escorting Beaufighters and almost all the Beauforts' air gunners popped away at it until it was left minus a float. The bewildered pilot must have had a very worried trip home.

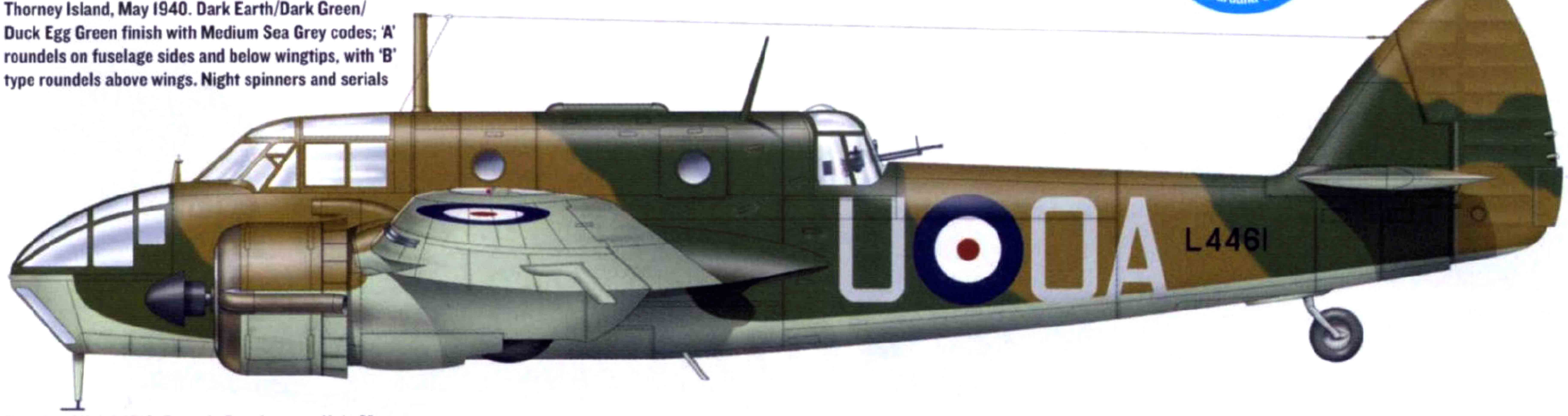
"6th September: Four motor vessels with escort of eleven destroyers, south-bound from Taranto, were attacked by twelve Beauforts. The intense flak and fighter attacks prevented the observation of results, but subsequent reconnaissance showed that one MV of 10,000 tons was sunk and another MV of 6,000 tons beached. All the Beauforts were attacked by fighters. Once again the Beaufighters saved the day with some damn good work — thanks boys! They bagged three, confirmed. One Beaufort shot down a Macchi C.200."



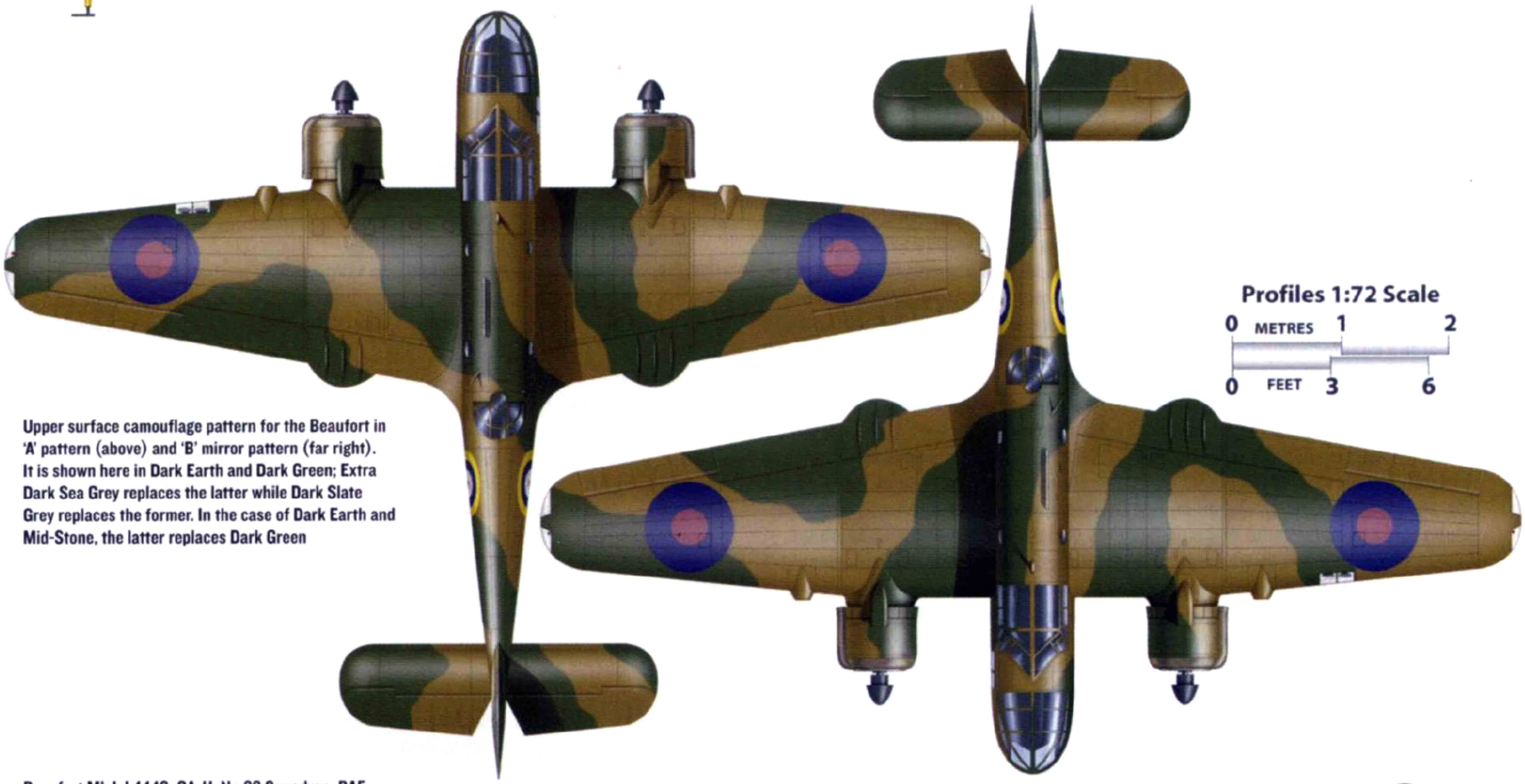
Beaufort Mk I AW240, •A is serviced in between sorties from Malta. This aircraft was operated by No. 39 Squadron (© R.J. Caruana Archives)

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2006

Beaufort Mk I, L4461, OA•U, No.22 Squadron, RAF Thorney Island, May 1940. Dark Earth/Dark Green/Duck Egg Green finish with Medium Sea Grey codes; 'A' roundels on fuselage sides and below wingtips, with 'B' type roundels above wings. Night spinners and serials



Beaufort Mk I, L4510, Torpedo Development Unit, May 1940. Dark Earth/Dark Green/Yellow finish with 'AI' type roundels on fuselage sides, 'A' type below wingtips and 'B' type above wings; Night serials and spinners. Note yellow/green chevron superimosed on fin flash



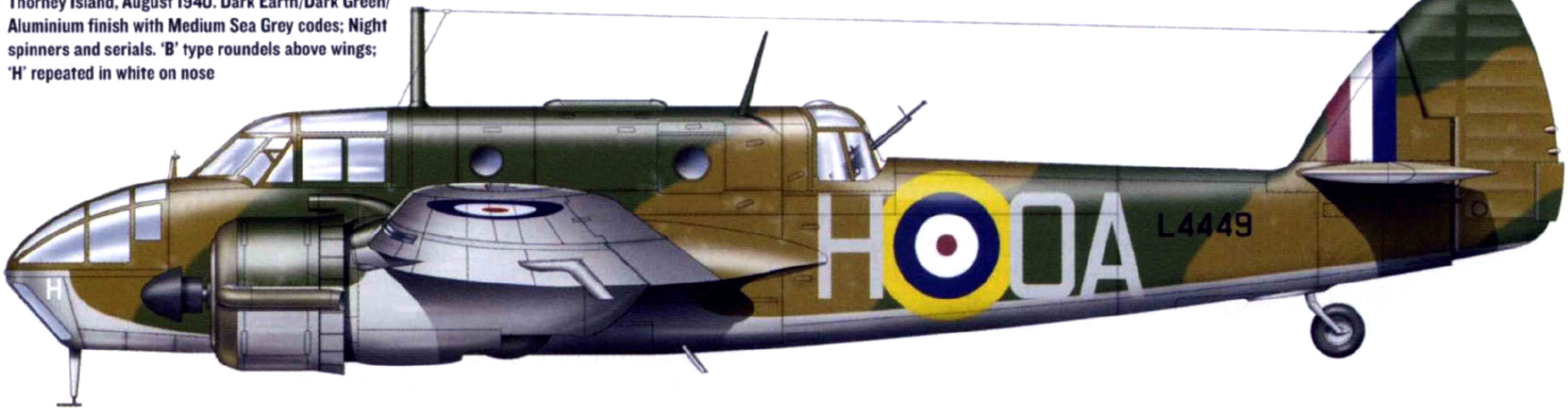
Upper surface camouflage pattern for the Beaufort in 'A' pattern (above) and 'B' mirror pattern (far right). It is shown here in Dark Earth and Dark Green; Extra Dark Sea Grey replaces the latter while Dark Slate Grey replaces the former. In the case of Dark Earth and Mid-Stone, the latter replaces Dark Green

Profiles 1:72 Scale

0 METRES 1 2

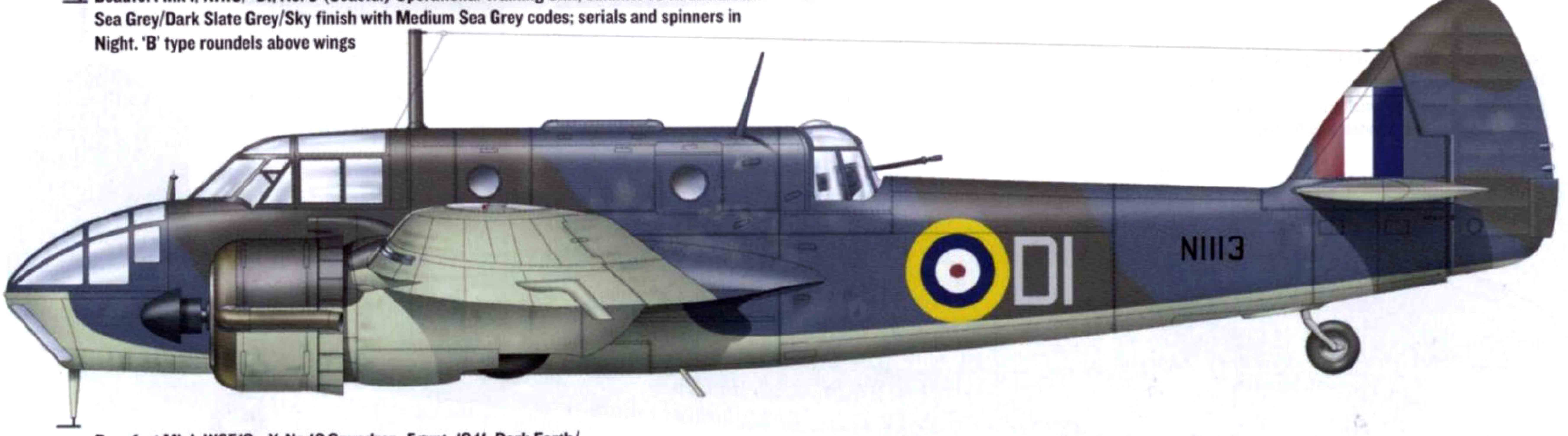
0 FEET 3 6

Beaufort Mk I, L4449, OA•H, No.22 Squadron, RAF Thorney Island, August 1940. Dark Earth/Dark Green/Aluminium finish with Medium Sea Grey codes; Night spinners and serials. 'B' type roundels above wings; 'H' repeated in white on nose

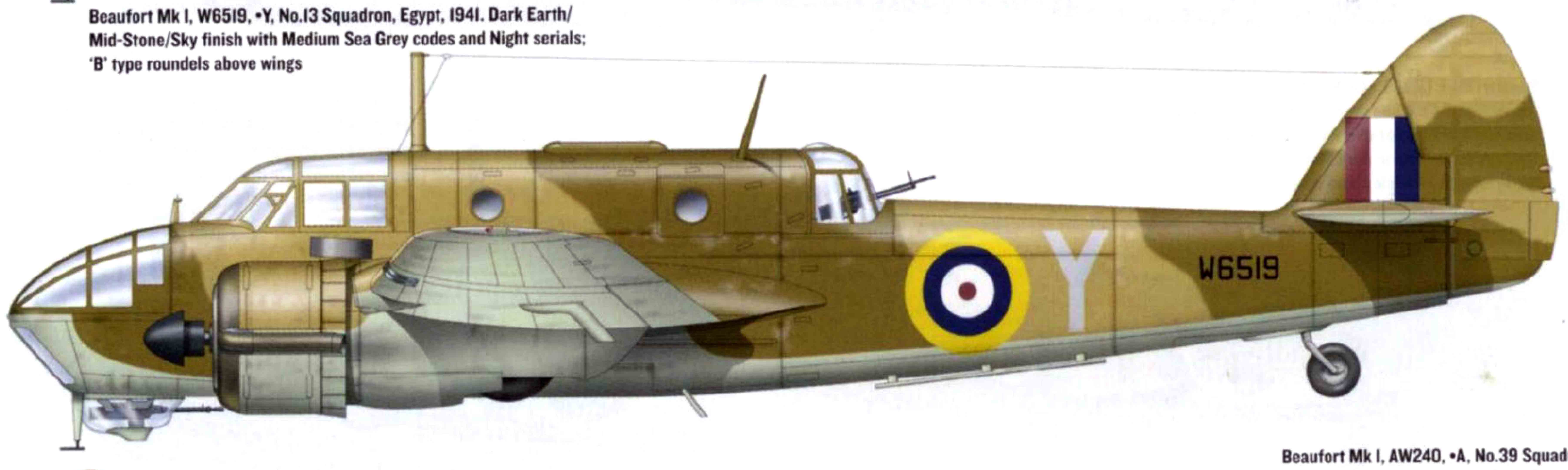


Beaufort Mk I, L9965, AW•M, No.42 Squadron, RAF Thorney Island, September 1940. Dark Earth/Dark Green/Aluminium finish with Medium Sea Grey codes; Night serials and spinners. 'B' type roundels above wings; 'Mercury' in red on nose

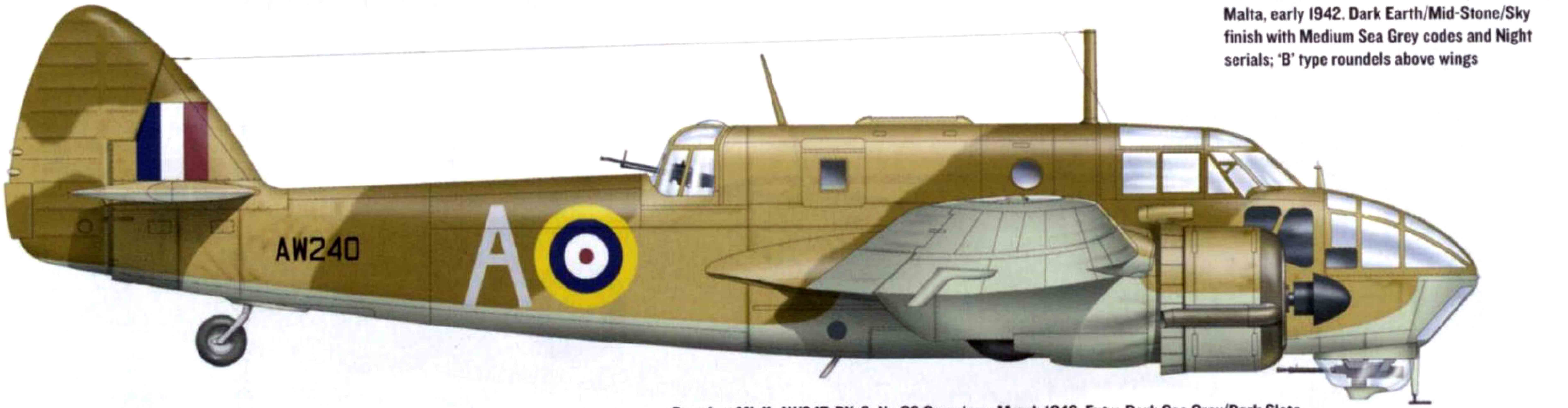
Beaufort Mk I, N1113, •DI, No. 3 (Coastal) Operational Training Unit, summer 1941. Extra Dark Sea Grey/Dark Slate Grey/Sky finish with Medium Sea Grey codes; serials and spinners in Night. 'B' type roundels above wings



Beaufort Mk I, W6519, •Y, No.13 Squadron, Egypt, 1941. Dark Earth/Mid-Stone/Sky finish with Medium Sea Grey codes and Night serials; 'B' type roundels above wings

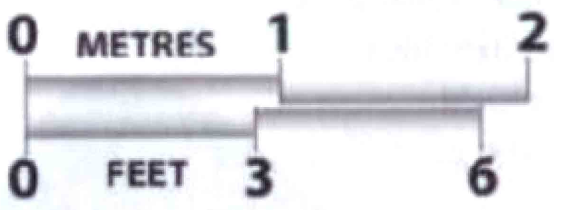


Beaufort Mk I, AW240, •A, No.39 Squadron, Luqa, Malta, early 1942. Dark Earth/Mid-Stone/Sky finish with Medium Sea Grey codes and Night serials; 'B' type roundels above wings

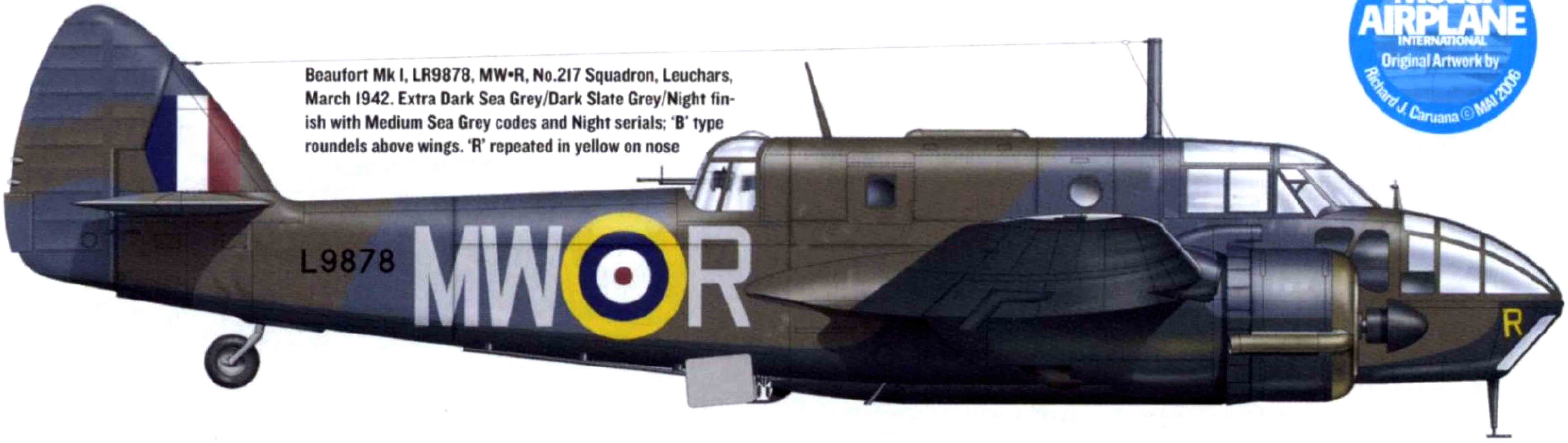


Beaufort Mk II, AW347, BX•S, No.86 Squadron, March 1942. Extra Dark Sea Grey/Dark Slate Grey/Night finish with white codes and night serials; 'B' type roundels above wings

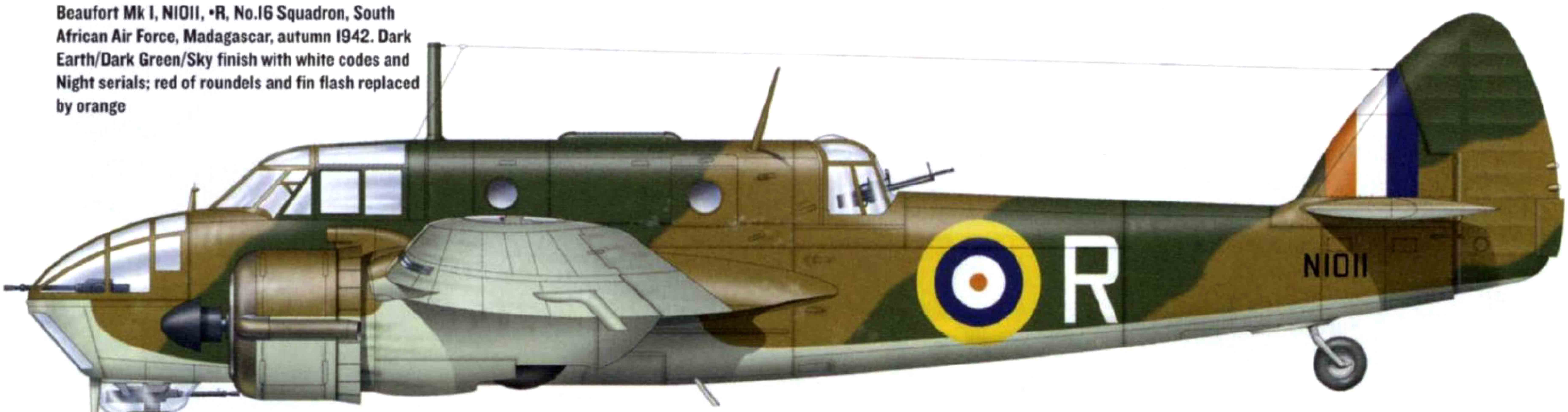
Profiles 1:72 Scale



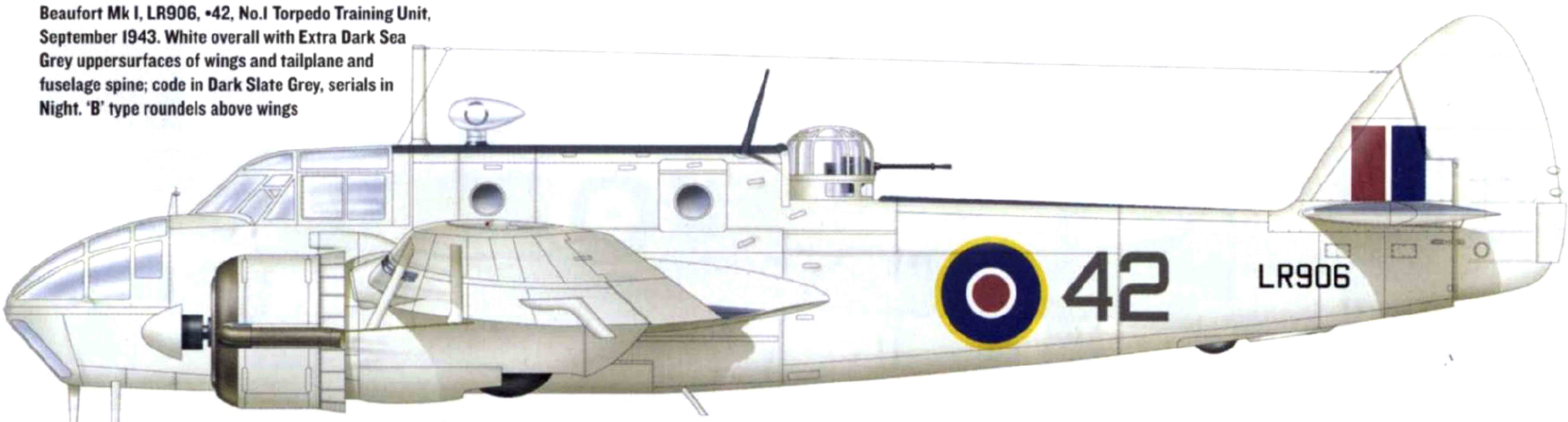
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006



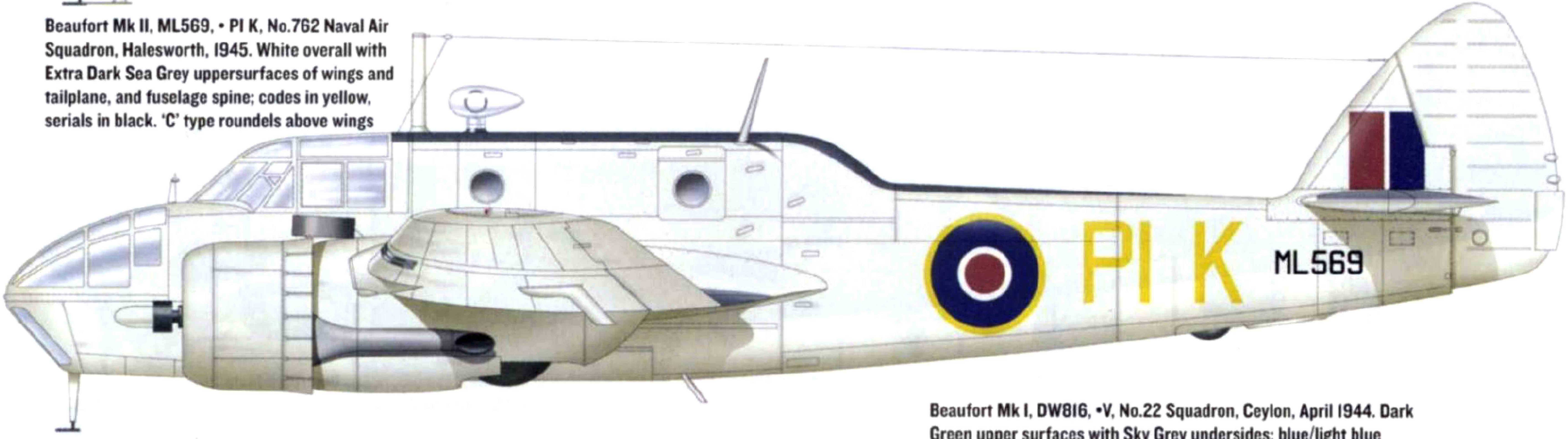
Beaufort Mk I, LR9878, MW•R, No.217 Squadron, Leuchars, March 1942. Extra Dark Sea Grey/Dark Slate Grey/Night finish with Medium Sea Grey codes and Night serials; 'B' type roundels above wings. 'R' repeated in yellow on nose



Beaufort Mk I, N1011, •R, No.16 Squadron, South African Air Force, Madagascar, autumn 1942. Dark Earth/Dark Green/Sky finish with white codes and Night serials; red of roundels and fin flash replaced by orange



Beaufort Mk I, LR906, •42, No.1 Torpedo Training Unit, September 1943. White overall with Extra Dark Sea Grey uppersurfaces of wings and tailplane and fuselage spine; code in Dark Slate Grey, serials in Night. 'B' type roundels above wings



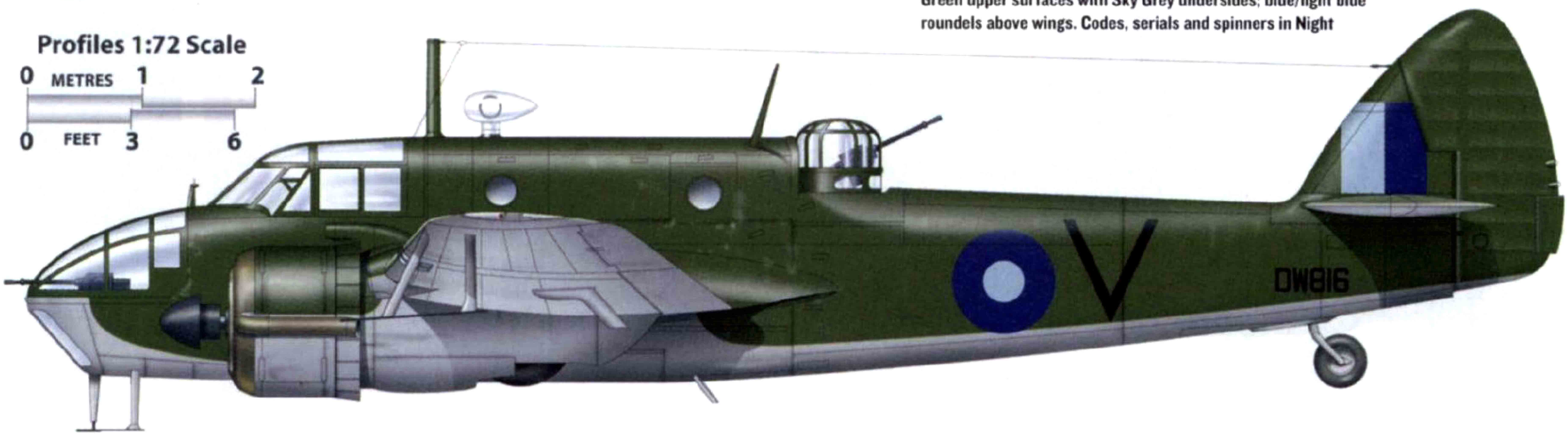
Beaufort Mk II, ML569, • PI K, No.762 Naval Air Squadron, Halesworth, 1945. White overall with Extra Dark Sea Grey uppersurfaces of wings and tailplane, and fuselage spine; codes in yellow, serials in black. 'C' type roundels above wings

Beaufort Mk I, DW816, •V, No.22 Squadron, Ceylon, April 1944. Dark Green upper surfaces with Sky Grey undersides; blue/light blue roundels above wings. Codes, serials and spinners in Night

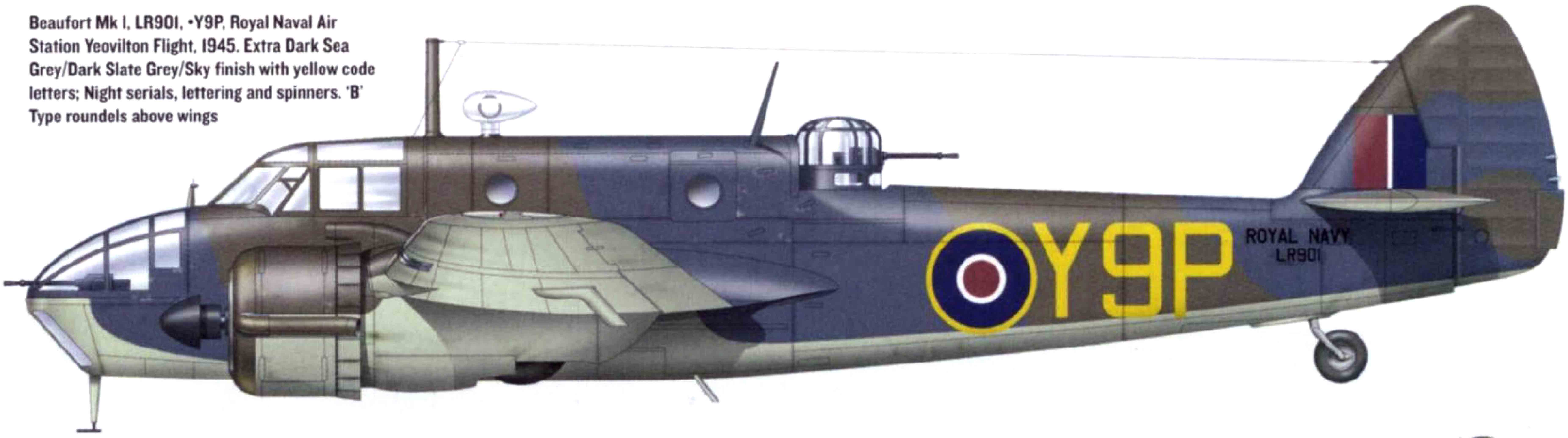
Profiles 1:72 Scale

0 METRES 1 2

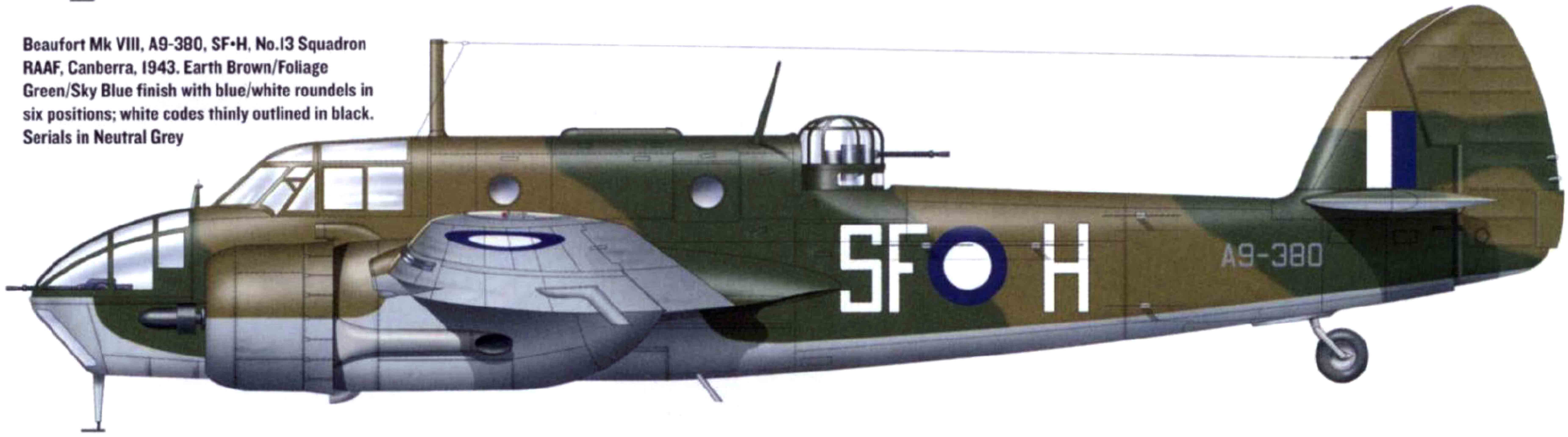
0 FEET 3 6



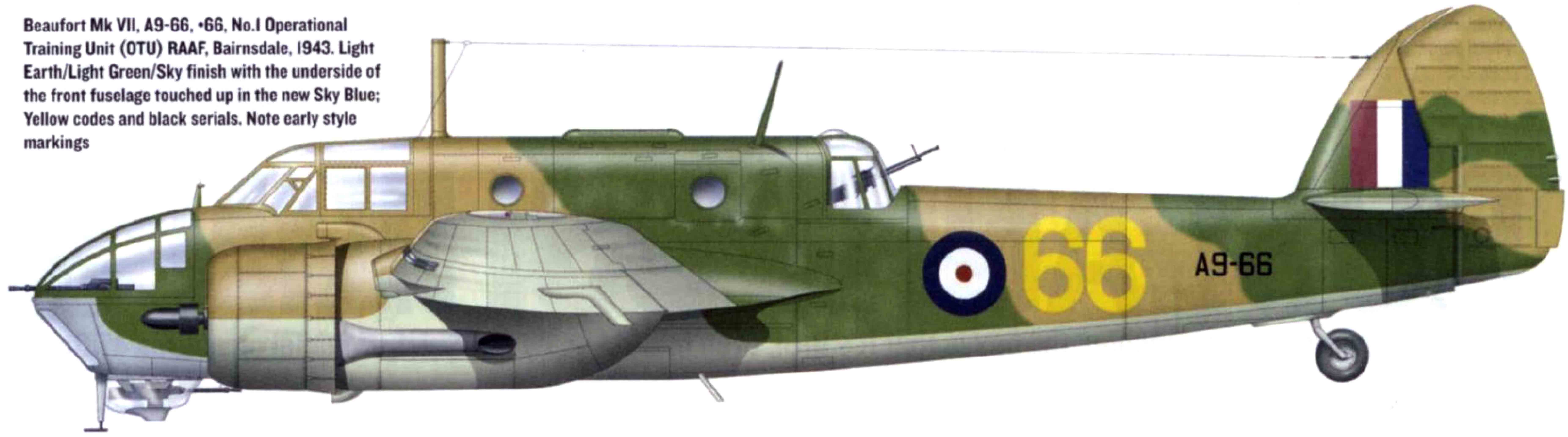
Beaufort Mk I, LR901, •Y9P, Royal Naval Air Station Yeovilton Flight, 1945. Extra Dark Sea Grey/Dark Slate Grey/Sky finish with yellow code letters; Night serials, lettering and spinners. 'B' Type roundels above wings



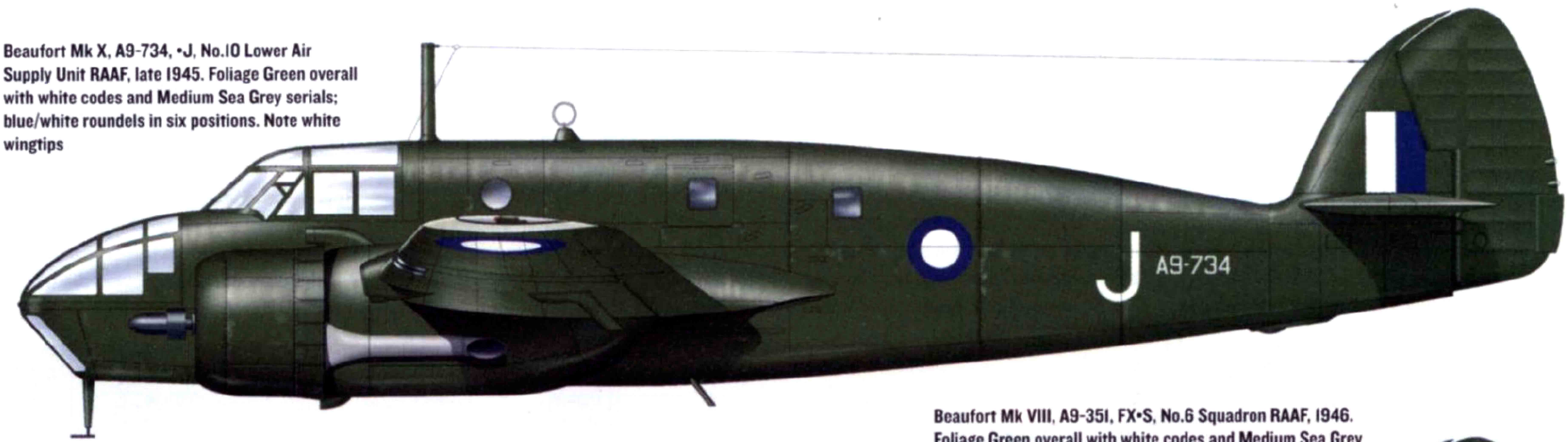
Beaufort Mk VIII, A9-380, SF•H, No.13 Squadron RAAF, Canberra, 1943. Earth Brown/Foliage Green/Sky Blue finish with blue/white roundels in six positions; white codes thinly outlined in black. Serials in Neutral Grey



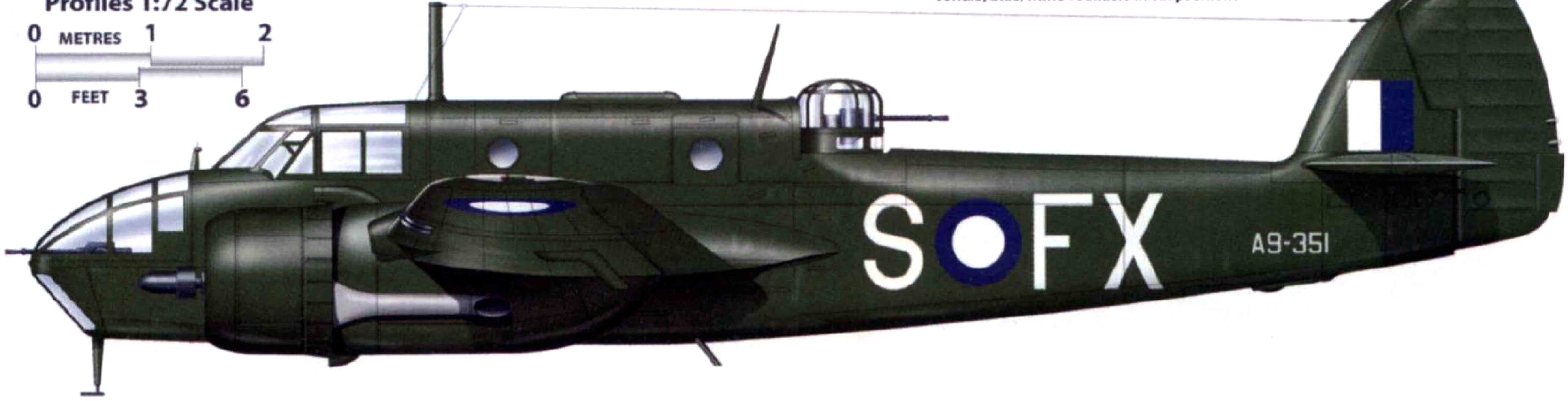
Beaufort Mk VII, A9-66, •66, No.1 Operational Training Unit (OTU) RAAF, Bairnsdale, 1943. Light Earth/Light Green/Sky finish with the underside of the front fuselage touched up in the new Sky Blue; Yellow codes and black serials. Note early style markings



Beaufort Mk X, A9-734, •J, No.10 Lower Air Supply Unit RAAF, late 1945. Foliage Green overall with white codes and Medium Sea Grey serials; blue/white roundels in six positions. Note white wingtips



Beaufort Mk VIII, A9-351, FX•S, No.6 Squadron RAAF, 1946. Foliage Green overall with white codes and Medium Sea Grey serials; blue/white roundels in six positions



Profiles 1:72 Scale

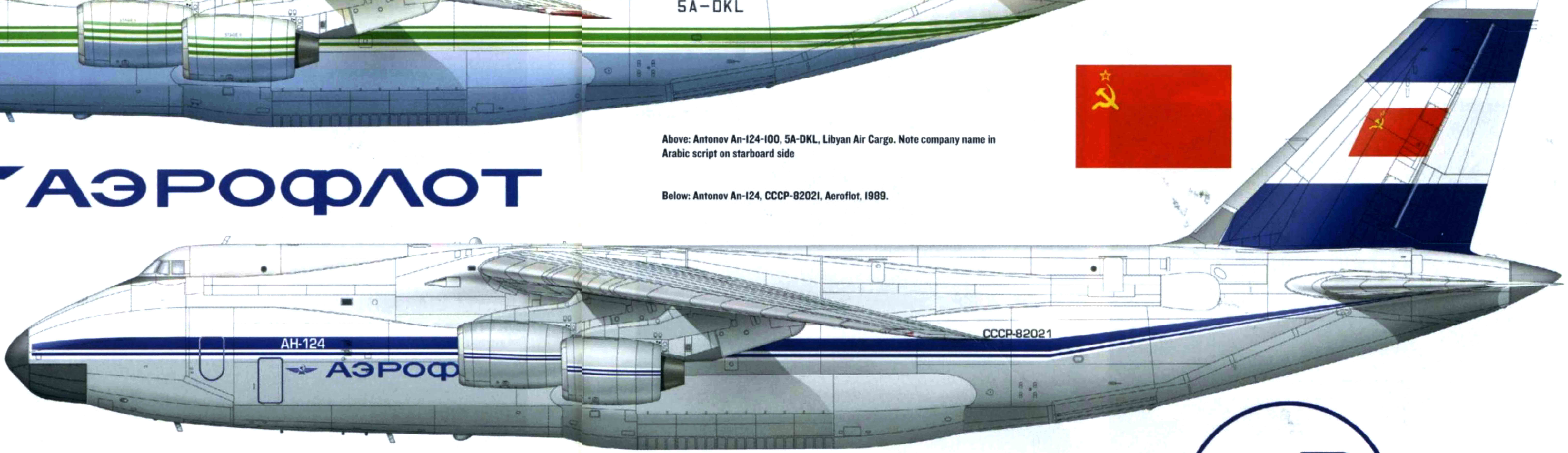
0 METRES 1 2

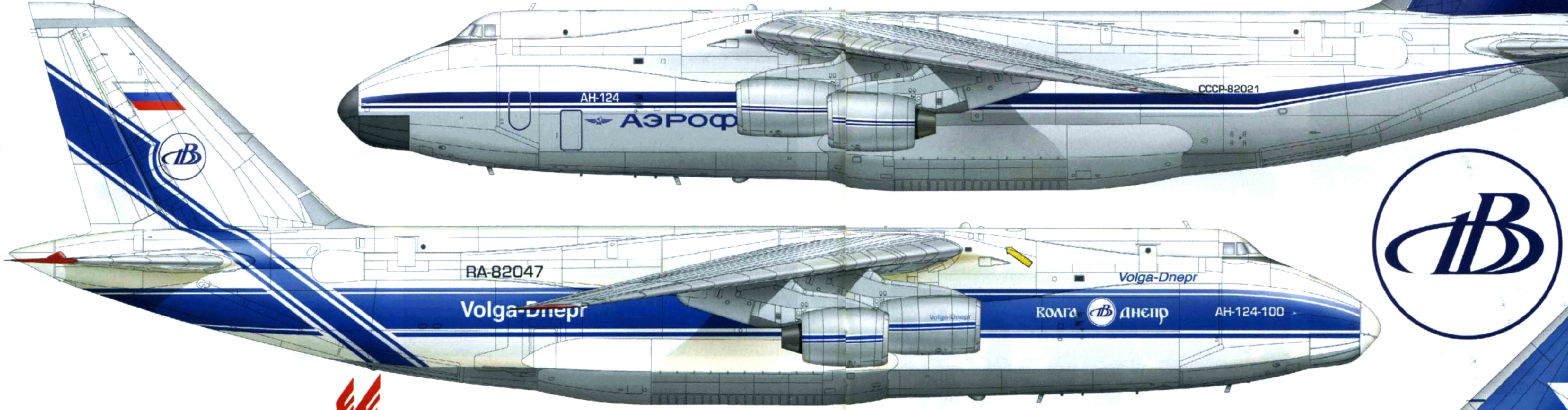
0 FEET 3 6

Above: Antonov An-124-100, 5A-DKL, Libyan Air Cargo. Note company name in Arabic script on starboard side

АЭРОФЛОТ

Below: Antonov An-124, CCCP-82021, Aeroflot, 1989.



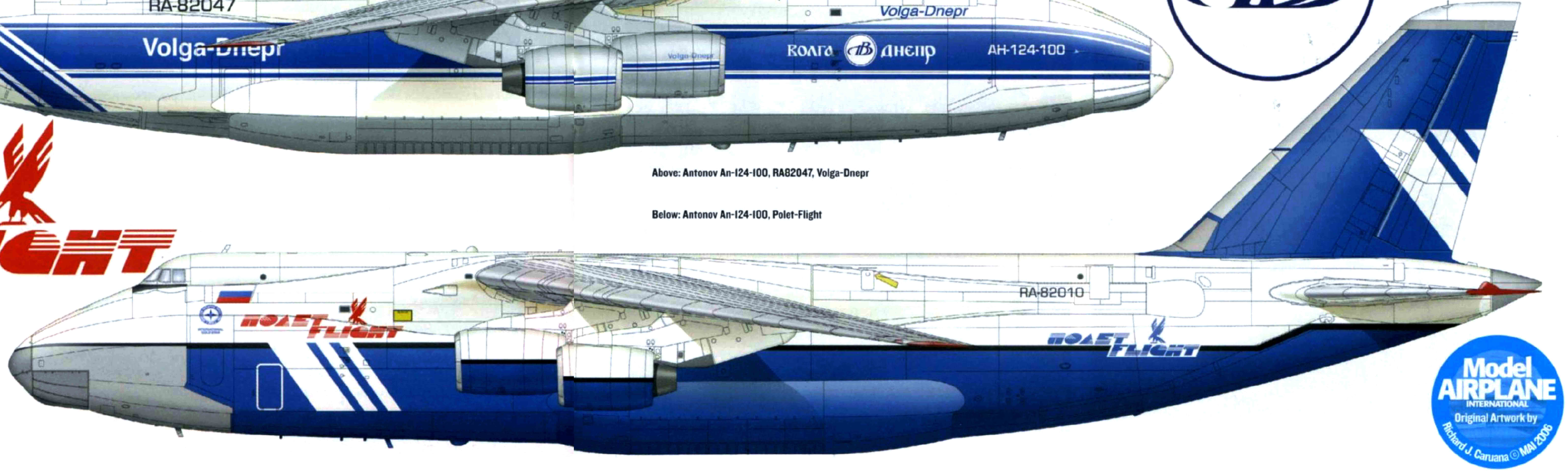


Above: Antonov An-124-100, RA82047, Volga-Dnepr

Below: Antonov An-124-100, Polet-Flight

ПОЛЕТ FLIGHT

BUSINESS INITIATIVE DIRECTIONS BID
INTERNATIONAL GOLD STAR



Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

The cavernous cargo area, looking towards the tail

The cargo area again, this time looking towards the front. Note the crane built into this area

PHOTO ALBUM - ANTONOV An-124

All photos © Ken Duffey

The internal structure of the tail area with that mix of colours used for each area

On the flight deck looking at the port side

A view behind the port seat on the flight deck showing the navigator's station

Overall view up into the massive hinged nose section. The canvas cover under the flight deck section is noteworthy

RA-82073 in a rather plain scheme

A look up at the roof of the flight deck area, which is surprisingly uncluttered

This is actually the view back behind the flight deck into the dorsal 'hump' above the cargo bay area

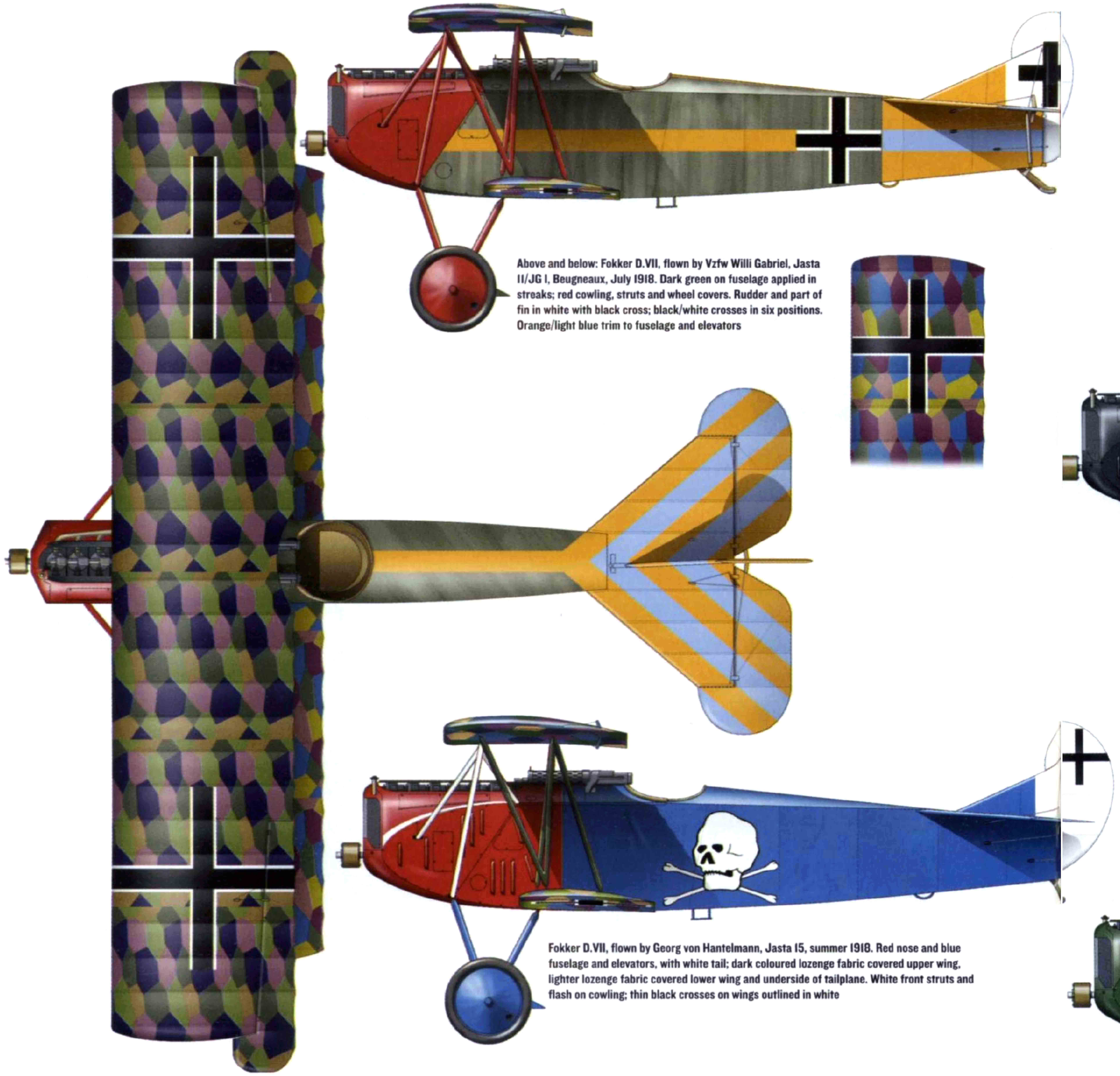
Overall view of the starboard seat on the flight deck

Some alternative schemes for the An-124. This is a Heavy Lift-VolgarDnepr operated example

ABOVE LEFT & RIGHT: Two views of RA-82075 in 'Cargo' livery

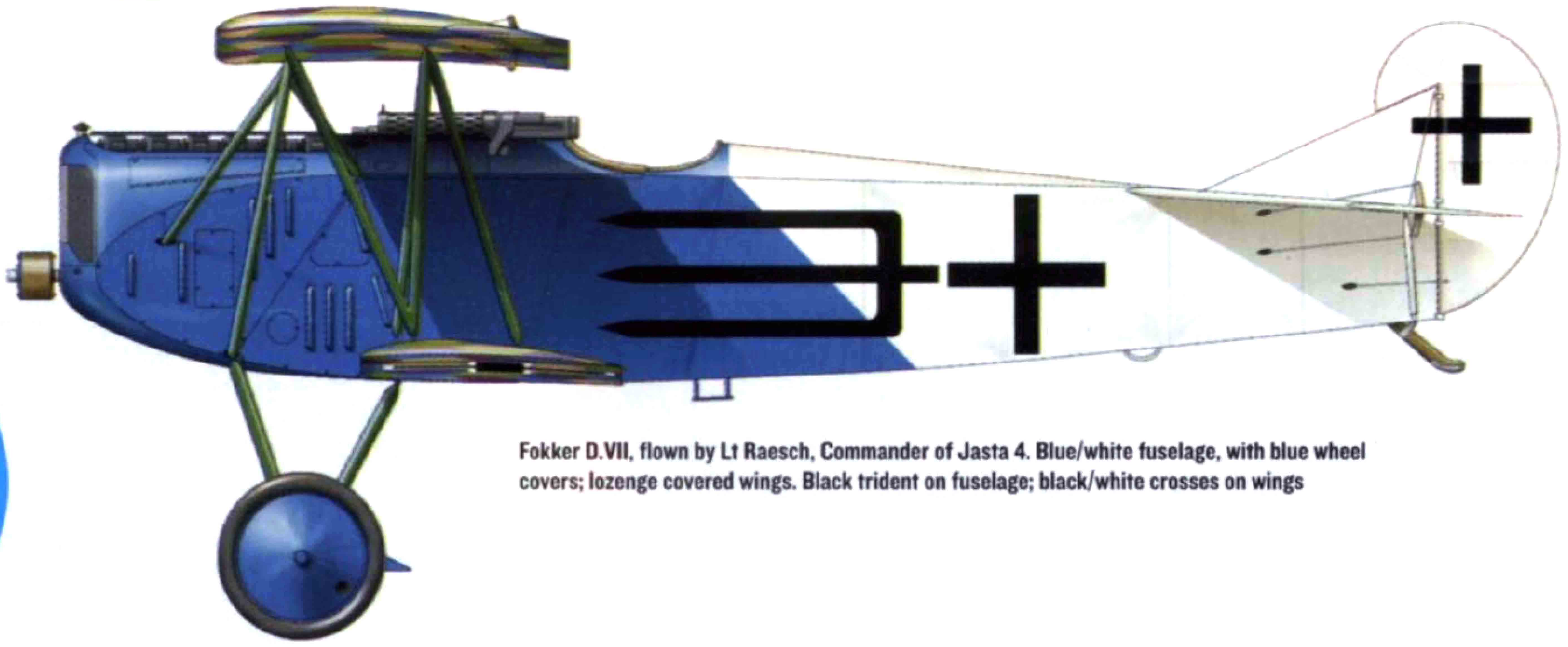
An-124 operated by Titan freight

RA-82027 operated by the manufacturer, Antonov

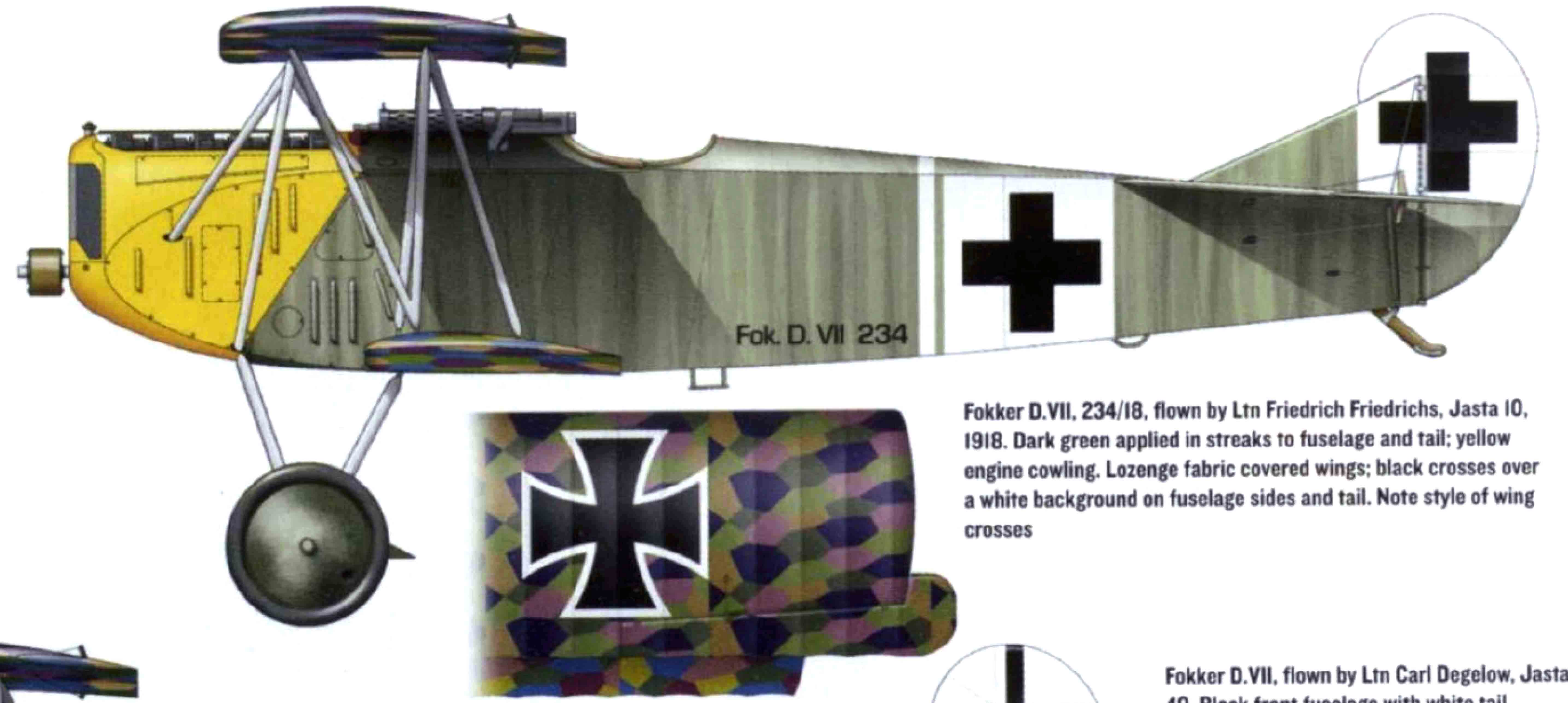


Above and below: Fokker D.VII, flown by Vzfw Willi Gabriel, Jasta 11/JG I, Beugneaux, July 1918. Dark green on fuselage applied in streaks; red cowling, struts and wheel covers. Rudder and part of fin in white with black cross; black/white crosses in six positions. Orange/light blue trim to fuselage and elevators

Fokker D.VII, flown by Georg von Hantelmann, Jasta 15, summer 1918. Red nose and blue fuselage and elevators, with white tail; dark coloured lozenge fabric covered upper wing, lighter lozenge fabric covered lower wing and underside of tailplane. White front struts and flash on cowling; thin black crosses on wings outlined in white

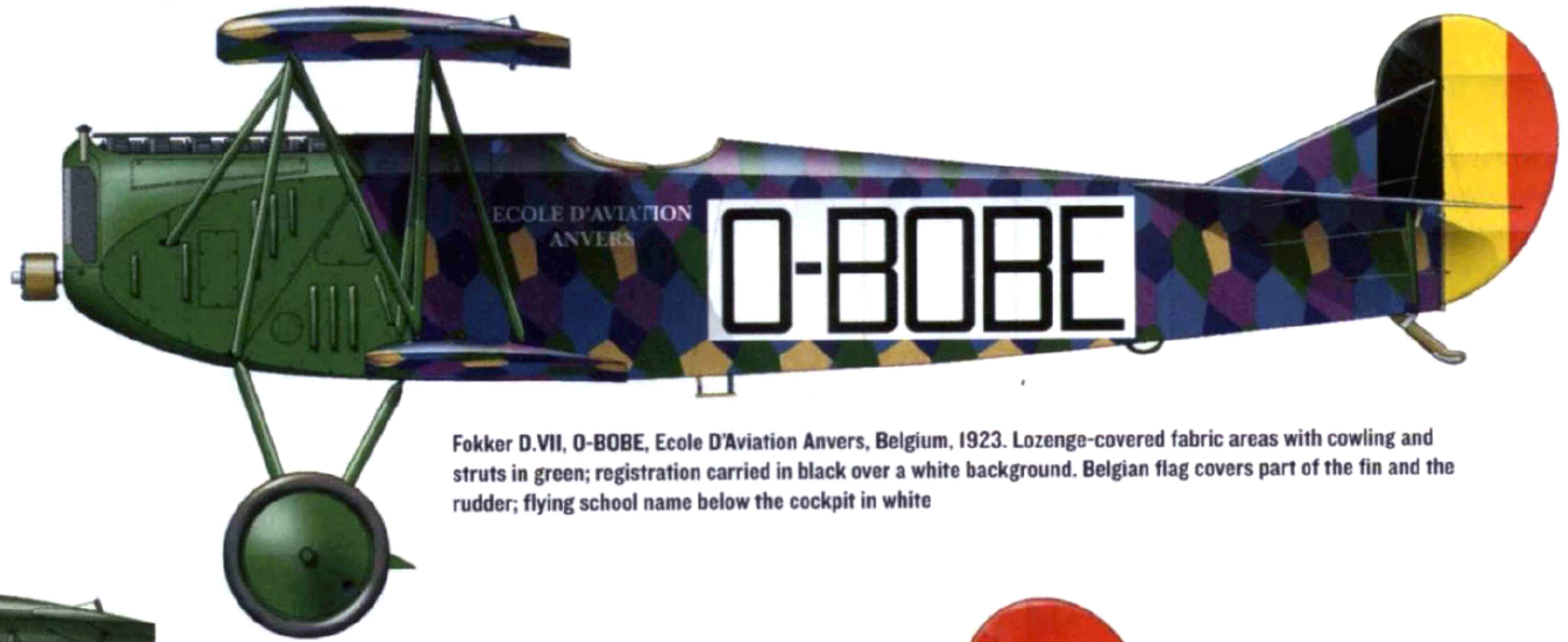


Fokker D.VII, flown by Lt Raesch, Commander of Jasta 4. Blue/white fuselage, with blue wheel covers; lozenge covered wings. Black trident on fuselage; black/white crosses on wings



Fokker D.VII, 234/18, flown by Ltn Friedrich Friedrichs, Jasta 10, 1918. Dark green applied in streaks to fuselage and tail; yellow engine cowling. Lozenge fabric covered wings; black crosses over a white background on fuselage sides and tail. Note style of wing crosses

Fokker D.VII, flown by Ltn Carl Degelow, Jasta 40. Black front fuselage with white tail section; lozenge covered wings. White stand with black detail and yellow antlers; thin black crosses outlined in white above top and below bottom wings



Fokker D.VII, O-BOBE, Ecole D'Aviation Anvers, Belgium, 1923. Lozenge-covered fabric areas with cowling and struts in green; registration carried in black over a white background. Belgian flag covers part of the fin and the rudder; flying school name below the cockpit in white

Fokker D.VII, F-301, Netherlands East Indies Air Force. Gloss dark green overall with white serial on fuselage sides; national markings in standard six positions. Red/white/blue horizontal stripes on rudder

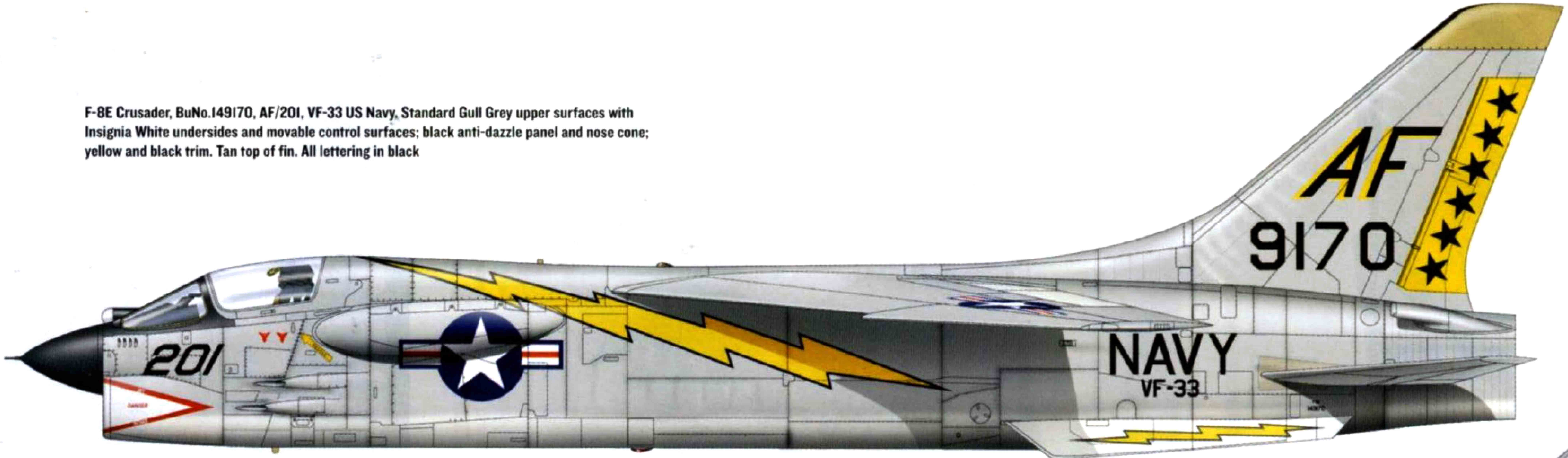
PROFILES & COMPLETE UPPER VIEWS
1:48 Scale

0 1 2
0 3 6

Fokker D.VII, 504/18, No. 15 Squadron, Polish Air Force, 1921. Lozenge covered fabric areas with engine cowling, struts, fin and rudder in dark green; early 'unbordered' type national markings in six positions and on rudder. White band around fuselage and white 'hand' marking below cockpit (the latter believed to have been carried also on starboard side)

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2006

F-8E Crusader, BuNo.149170, AF/201, VF-33 US Navy. Standard Gull Grey upper surfaces with Insignia White undersides and movable control surfaces; black anti-dazzle panel and nose cone; yellow and black trim. Tan top of fin. All lettering in black

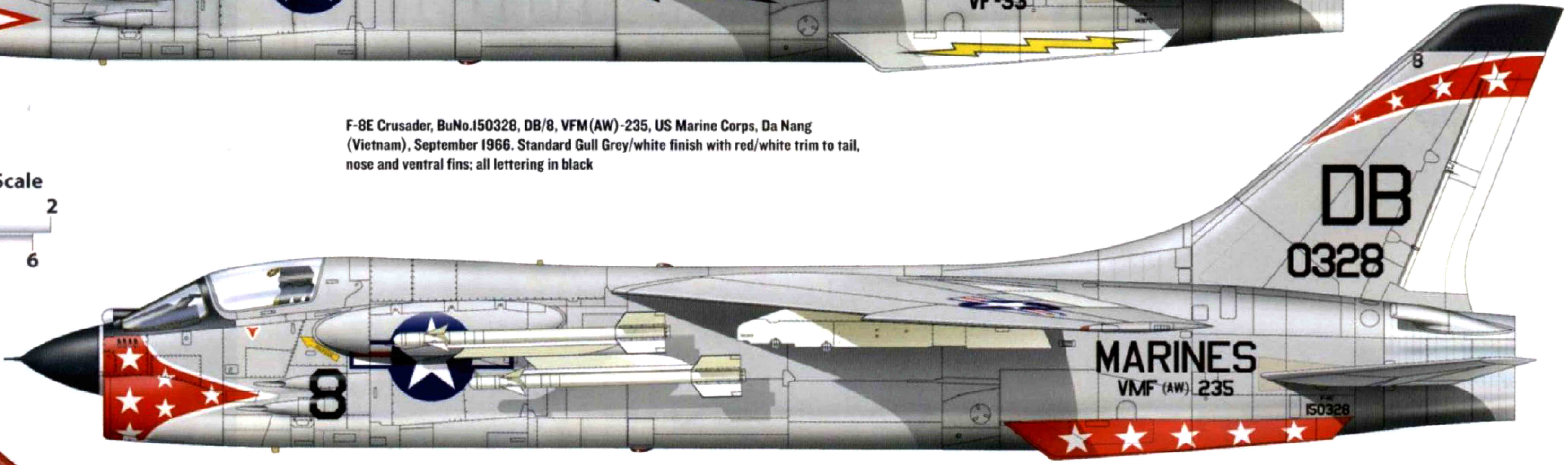


F-8E Crusader, BuNo.150328, DB/8, VFM(AW)-235, US Marine Corps, Da Nang (Vietnam), September 1966. Standard Gull Grey/white finish with red/white trim to tail, nose and ventral fins; all lettering in black

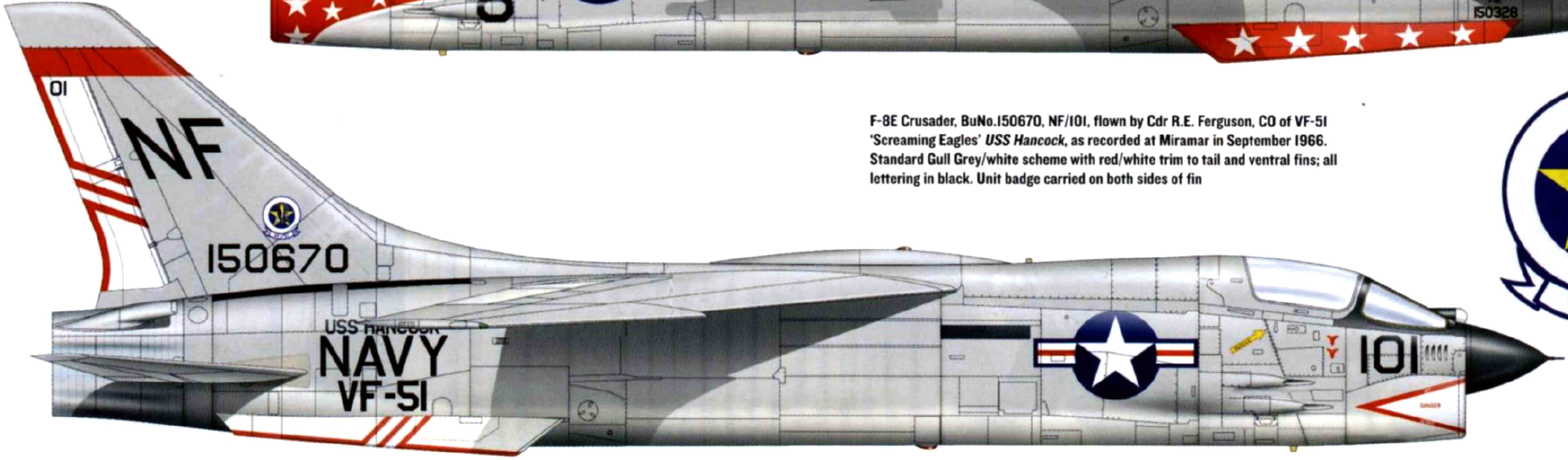
Profiles 1:72 Scale

0 METRES 1 2

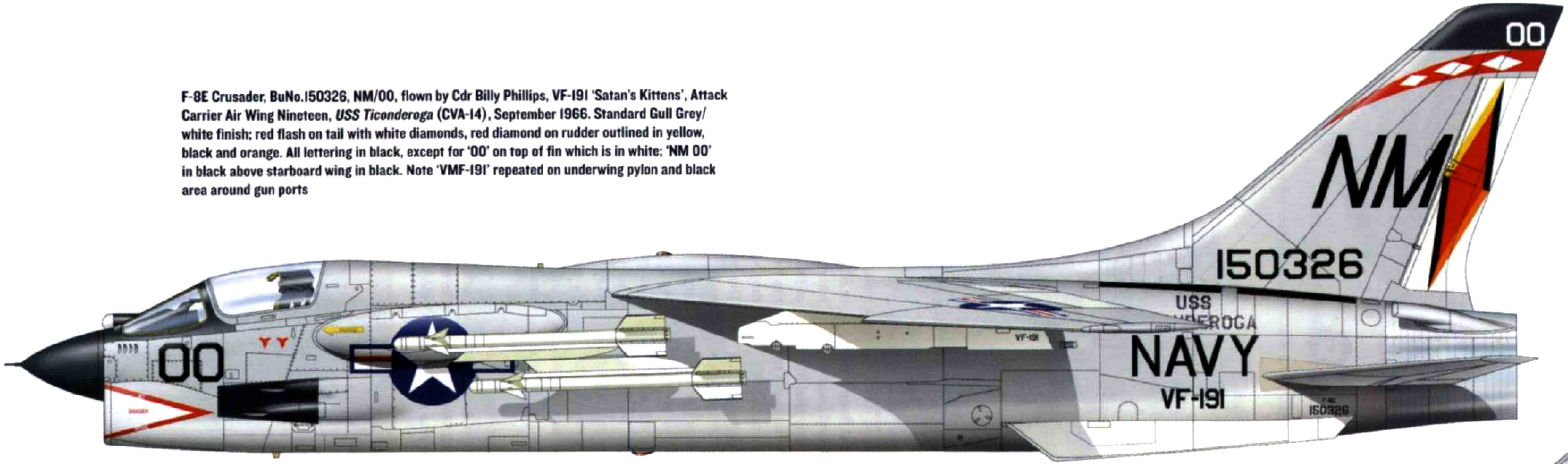
0 FEET 3 6



F-8E Crusader, BuNo.150670, NF/101, flown by Cdr R.E. Ferguson, CO of VF-51 'Screaming Eagles' *USS Hancock*, as recorded at Miramar in September 1966. Standard Gull Grey/white scheme with red/white trim to tail and ventral fins; all lettering in black. Unit badge carried on both sides of fin



F-8E Crusader, BuNo.150326, NM/00, flown by Cdr Billy Phillips, VF-191 'Satan's Kittens', Attack Carrier Air Wing Nineteen, *USS Ticonderoga* (CVA-14), September 1966. Standard Gull Grey/white finish; red flash on tail with white diamonds, red diamond on rudder outlined in yellow, black and orange. All lettering in black, except for '00' on top of fin which is in white; 'NM 00' in black above starboard wing in black. Note 'VMF-191' repeated on underwing pylon and black area around gun ports

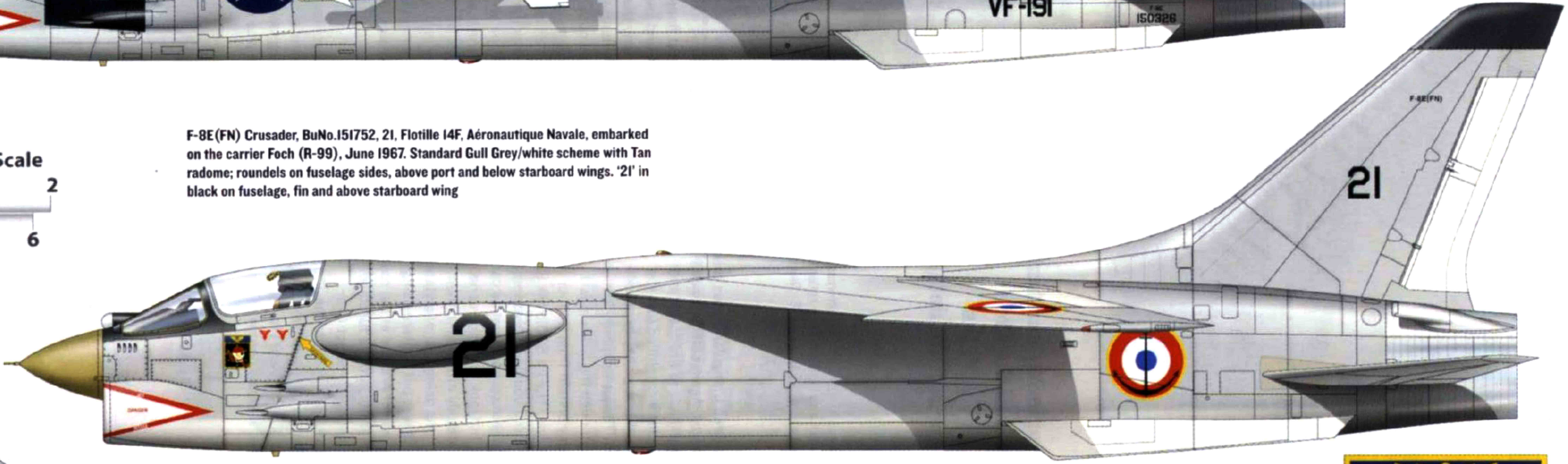


Profiles 1:72 Scale

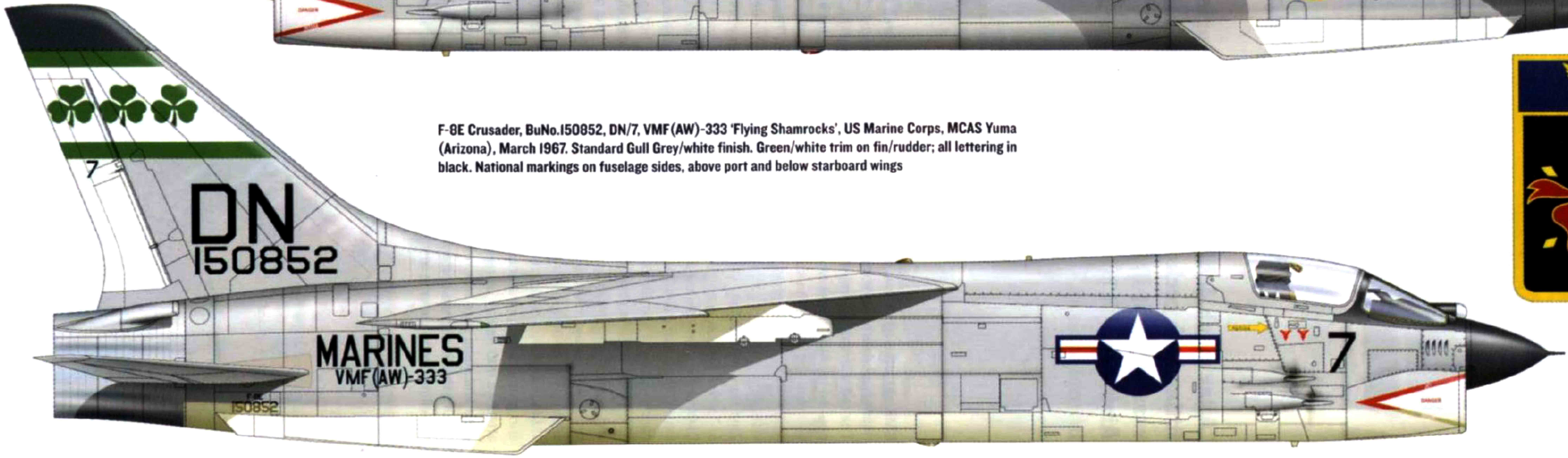
0 METRES 1 2

0 FEET 3 6

F-8E(FN) Crusader, BuNo.151752, 21, Flotille 14F, Aéronautique Navale, embarked on the carrier Foch (R-99), June 1967. Standard Gull Grey/white scheme with Tan radome; roundels on fuselage sides, above port and below starboard wings. '21' in black on fuselage, fin and above starboard wing



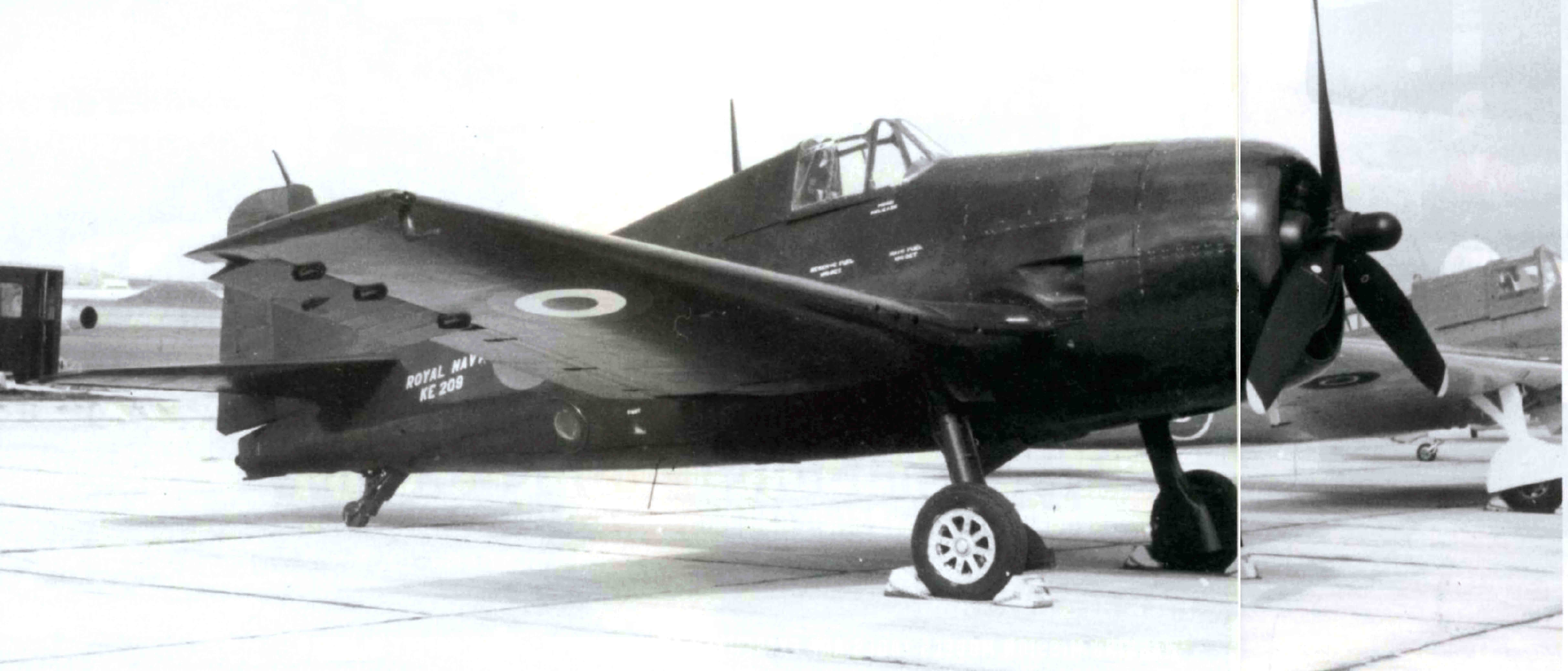
F-8E Crusader, BuNo.150852, DN/7, VMF(AW)-333 'Flying Shamrocks', US Marine Corps, MCAS Yuma (Arizona), March 1967. Standard Gull Grey/white finish. Green/white trim on fin/rudder; all lettering in black. National markings on fuselage sides, above port and below starboard wings



Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

Grumman F6F-5 Hellcat, BuNo.79603, 25/RF photographed on 16 August 1946 in typical post-war finish of Sea Blue Gloss overall with white lettering and an orange band around the rear fuselage to indicate that it belonged to a reserve unit (*Grumman*)

Hellcat FR Mk II, serial KE209, that had seen service with the Fleet Air Arm is seen here during a post-war air display in the company of a Fairey Fulmar. Note the camera port below the fuselage, aft of the wing trailing edge. Today this aircraft can be seen at the FAA Museum, Yeovilton (*R.J. Caruana*)



GRUMMAN'S BIG CAT

WRITTEN BY RICHARD J. CARUANA

Launched in mid-1941 as an insurance against failure of the F4U Corsair, the Grumman Hellcat was to become the mainstay of Unites States Navy (USN) carrier fighter operations in the Pacific.

With a 'kill-to-loss' ratio of nineteen to one in its favour, it accounted for no fewer than 5,150 enemy machines destroyed, bagging 4,947 of the 6,477 aerial victories claimed by USN carrier pilots during the Second World War.

From combat reports coming across the Atlantic after the first year of hostilities, it had become obvious to the USN that the F4F Wildcat was already inferior in performance and firepower by European standards. While the XF4U-1 – eventually to become the Corsair – had initiated its flight trials, the USN preferred to act prudently and have another naval fighter in hand should Chance-Vought's design not meet expected specifications.

Thus Grumman Aircraft Corporation's design team, headed by Leroy R. Grumman and William T. Schwendler, began work on an 'improved F4F'. Wind tunnel tests were conducted with a 1:16 scale model of the company project, bearing the designation G-50. A contract for two prototypes of the new fighter, designated XF6F-1, powered by a Wright R-2600-10 Cyclone air-cooled twin-row, 14-cylinder radial, was issued on 30 June 1941. Grumman's engineering team had sought the opinion of USN pilots as to what form the new carrier fighter should take and soon concluded that the development of the Wildcat would entail a complete redesign that bore only vague external resemblance to the F4F.

Additional weight of 60 percent over that of the F4F was mainly due to a substantial increase in internal fuel load and ammunition. This necessitated a wing area that proved to be the largest of any wartime US single-engined production fighter. It was mounted on the fuselage at the minimum angle of incidence to obtain the least amount of drag in level flight. The pilot was seated at the highest point of the fuselage giving him an excellent view forward and to both sides.

During the course of design and construction of the prototypes, the Mitsubishi A6M Zero had been encountered in combat and had shown that it was markedly superior to the F4F Wildcat. Grumman at one stage even debated the superior performance of a lightweight fighter, like the A6M, but this could only be achieved by sacrificing sturdiness of design and some 212lb of armour that was planned to provide protection for the pilot and vital sections of the XF6F-1. Traditional methods won the day, no doubt in preference for a fighter aircraft that could absorb as much punishment as possible during combat.

The sturdy construction also meant that Grumman's fighter would carry a strong fixed armament, in the form of six 0.5inch Colt-Browning machine guns with a maximum of 400 rounds per gun (rpg). Its overall weight was 12,000lb (eventually to rise to 15,000lb), double that of the aircraft that was to become its arch-rival, the Zero. Notwithstanding this, the Hellcat's primary requirement was to achieve a high performance without sacrificing armour protection, structural strength or firepower.

Selden A. Converse took the first XF6F-1 up for its maiden flight on 26 June 1942, less than a year after the design had been initiated. This was only a few weeks after the Battle of Midway; though this first major USN action was considered to have been a success, several lessons were learnt that were to influence naval aviation thinking for the rest of the war. As a result Grumman's President, Leon A. Swirbul, was summoned to Pearl Harbor where he met the Navy's combat tactics expert Lt Cdr J.S. Thatch. The latter insisted that projected performance figures for the production versions of the XF6F had to be improved if USN pilots were to oppose the A6M Zero on a par or, far more preferably, with an advantage.

A decision was taken to exchange the planned R-2600 Cyclone in favour of the Pratt & Whitney R-2800 (B) Double Wasp, which provided some 25 percent extra power. The latter was installed in the second prototype (XF6F-3), which took to the air for the first time on 30 July 1942 with the type being named Hellcat soon afterwards.

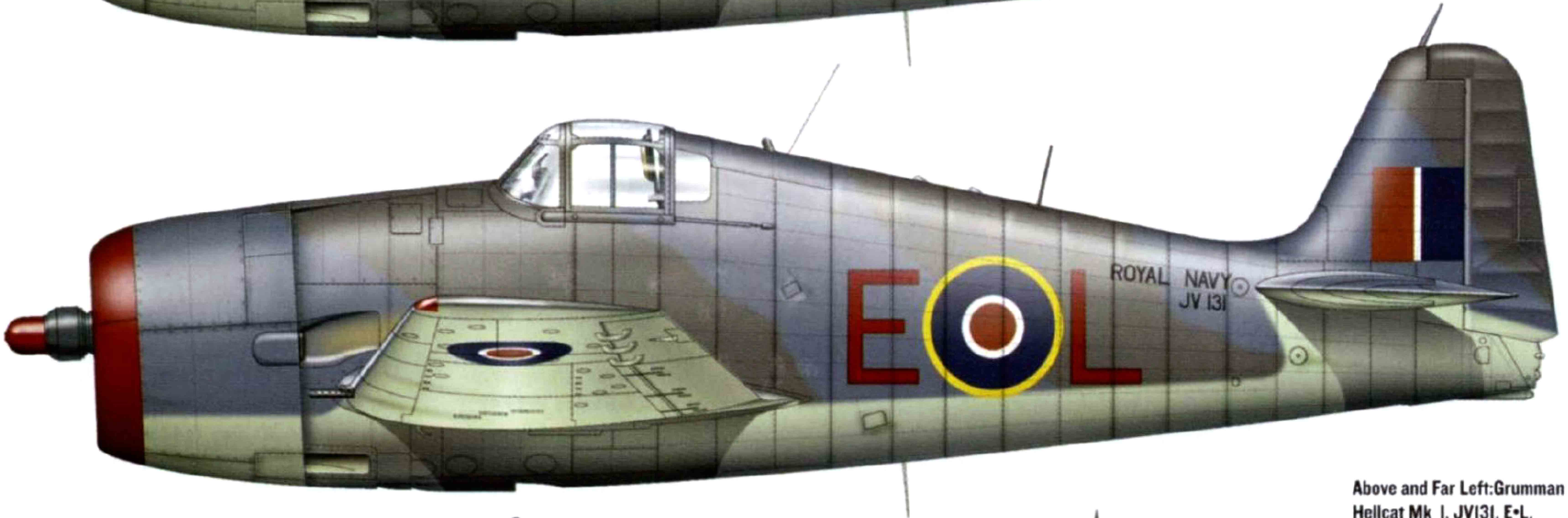
Official trials began in earnest that summer, and the USN Bureau of Aeronautics was favourably impressed, especially by the excellent pilot's field of vision. Apart from some corrections to eradicate some longitudinal instability, the aircraft was found to be 'generally satisfactory'. It was also found that excessive trim change was necessary between flaps-up and -down movement, limiting dive speeds to 525mph due to flutter. This, together with some other minor snags, was ironed out as the first production aircraft were on the final assembly line, and included the replacement of the Curtiss Electric propeller with a Hamilton Standard unit and the elimination of the airscrew spinner.

Quantity production had been ordered on 23 May 1942, nearly a month before the flight of the first prototype, and Grumman immediately responded with an aggressive production schedule. A pre-production plant was set up at the Bethpage plant, where the first batch of F6F-3s could be built, while a special plant for the production of the Hellcat was being constructed. Even so, production jigs were already being set up and by October production started down the assembly line while work on the building was still going on. The first production F6F-3 flew for the first time on 3 October 1942.

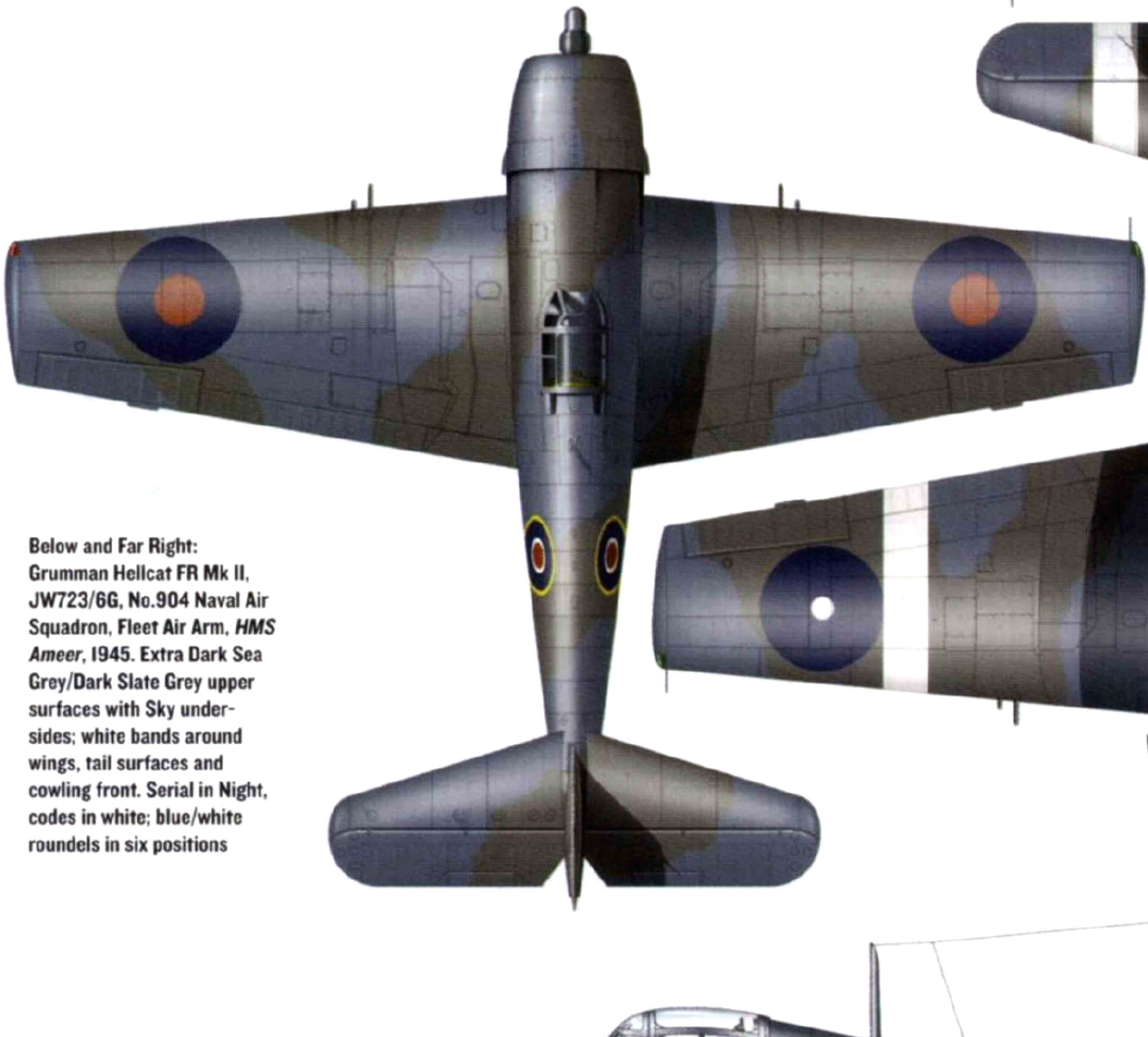
The production F6F-3 Hellcat was powered by a Pratt & Whitney R-2800-10 Twin Wasp two-row radial rated at 2,000hp (maximum) at 2,700 revolutions per minute (rpm). Internal fuel, housed in self-sealing fuel cells, consisted a 60 US gallon tank beneath the pilot's seat and one in each wing with a capacity of 87.5 US gallons. This total of 235 US gallons carried internally ➤

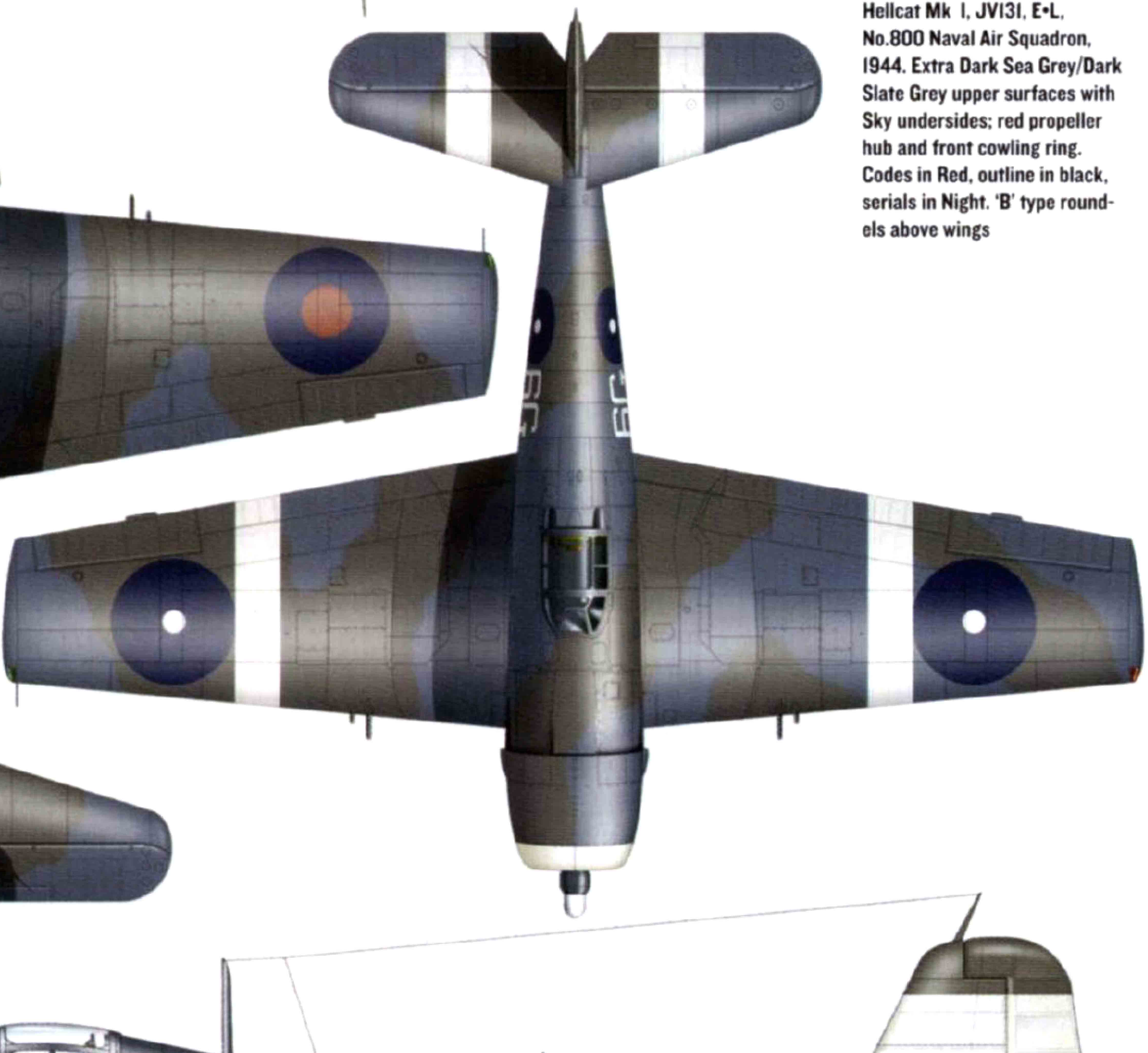
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

Grumman Hellcat Mk I, FN429/C, No.800 Squadron Fleet Air Arm, 1943. Extra Dark Sea Grey and Dark Slate Grey upper surfaces, with Sky undersides. Black propeller boss; type 'CI' roundels on fuselage, type 'B' above wings and type 'C' under wings. Note that Gannet was the name originally given to the Hellcat in Royal Navy service



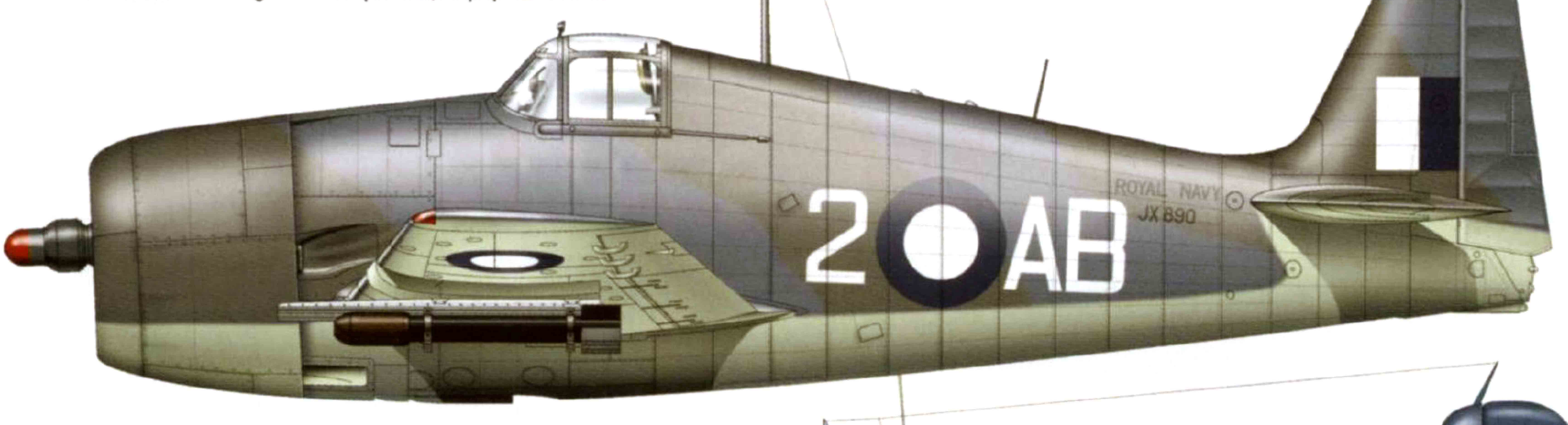
Above and Far Left: Grumman Hellcat Mk I, JV131, E•L, No.800 Naval Air Squadron, 1944. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; red propeller hub and front cowling ring. Codes in Red, outline in black, serials in Night. 'B' type roundels above wings





Below and Far Right: Grumman Hellcat FR Mk II, JW723/6G, No.904 Naval Air Squadron, Fleet Air Arm, *HMS Ameer*, 1945. Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; white bands around wings, tail surfaces and cowling front. Serial in Night, codes in white; blue/white roundels in six positions

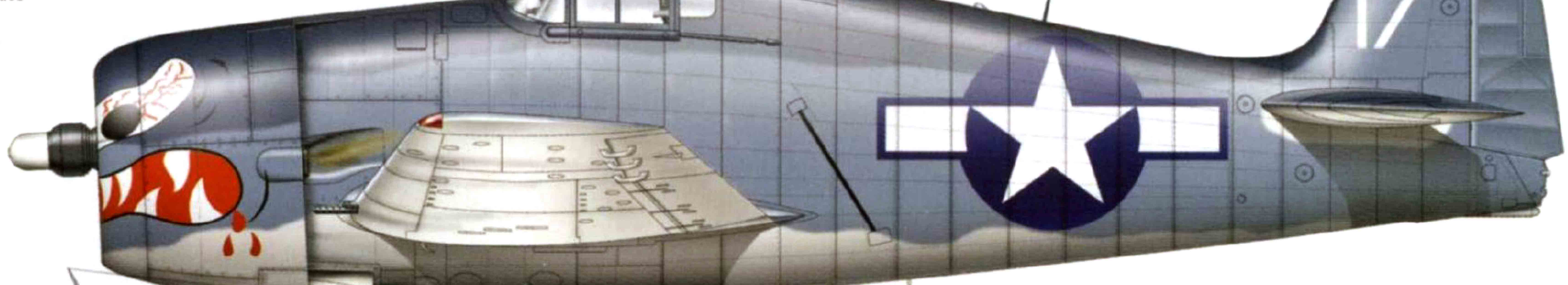
Grumman Hellcat FB Mk II, JX890, 2•AB, No.896 Naval Air Squadron, Fleet Air Arm, Wingfield (South Africa), April 1945 (prior to sailing for Ceylon on *HMS Ameer*). Extra Dark Sea Grey/Dark Slate Grey upper surfaces with Sky undersides; serial in Night, codes in white. Blue/White national markings in standard positions; red propeller hub front



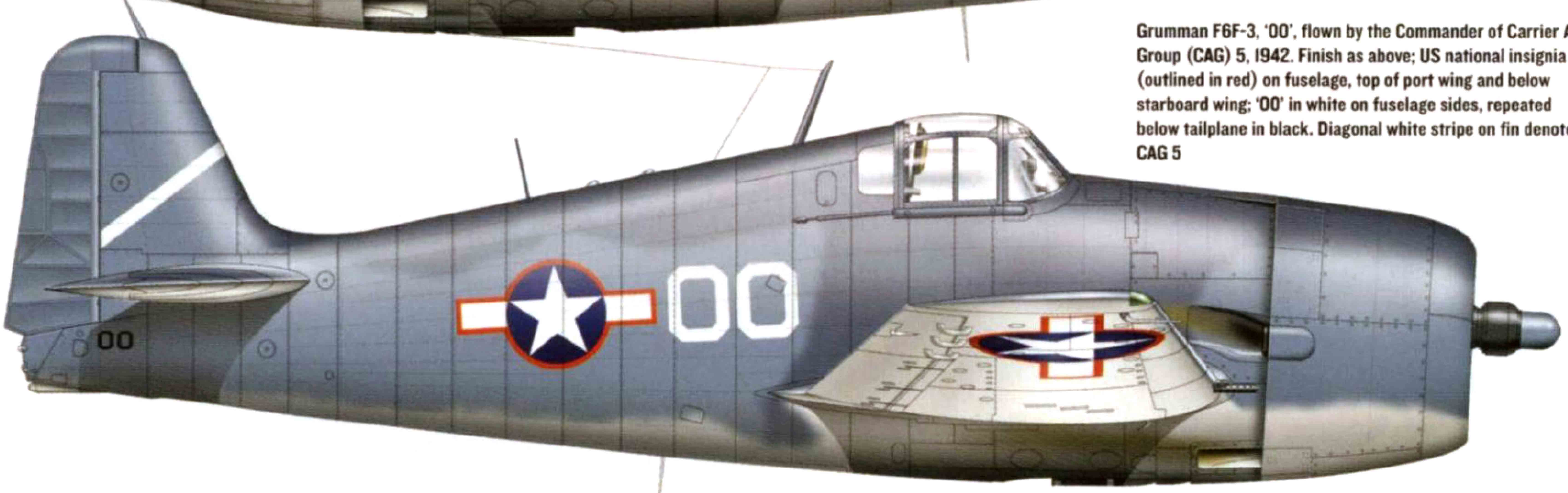
Grumman Hellcat Mk II, JX995, B9•R, No.898 Naval Air Squadron, Fleet Air Arm, 1945. Sea Blue Gloss overall with serial, bands around wings, tailplane and air intake in white; red codes and propeller hub. Blue/white roundels in six positions

Grumman Hellcat Mk II, JZ935, 145/W, No.1844 Naval Air Squadron, Fleet Air Arm, *HMS Indomitable*, 1945. Sea Blue Gloss overall with white codes and serials; blue/white markings on fuselage sides, above port and below starboard wing

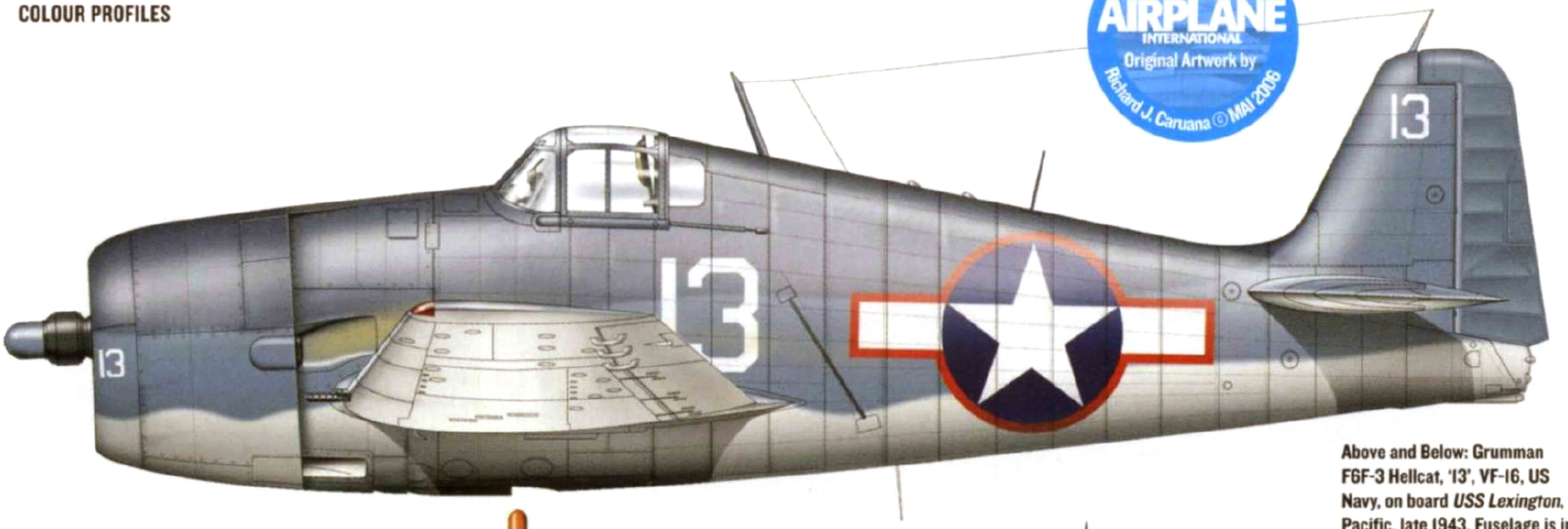
Grumman F6F-3, '17', of VF-37, *USS Princetown* (CVL-23). Non-Specular Intermediate Blue with Non-Specular Sea Blue top decking; top of wings and tailplane is Non-Specular Sea Blue. Non-Specular Insignia White undersides



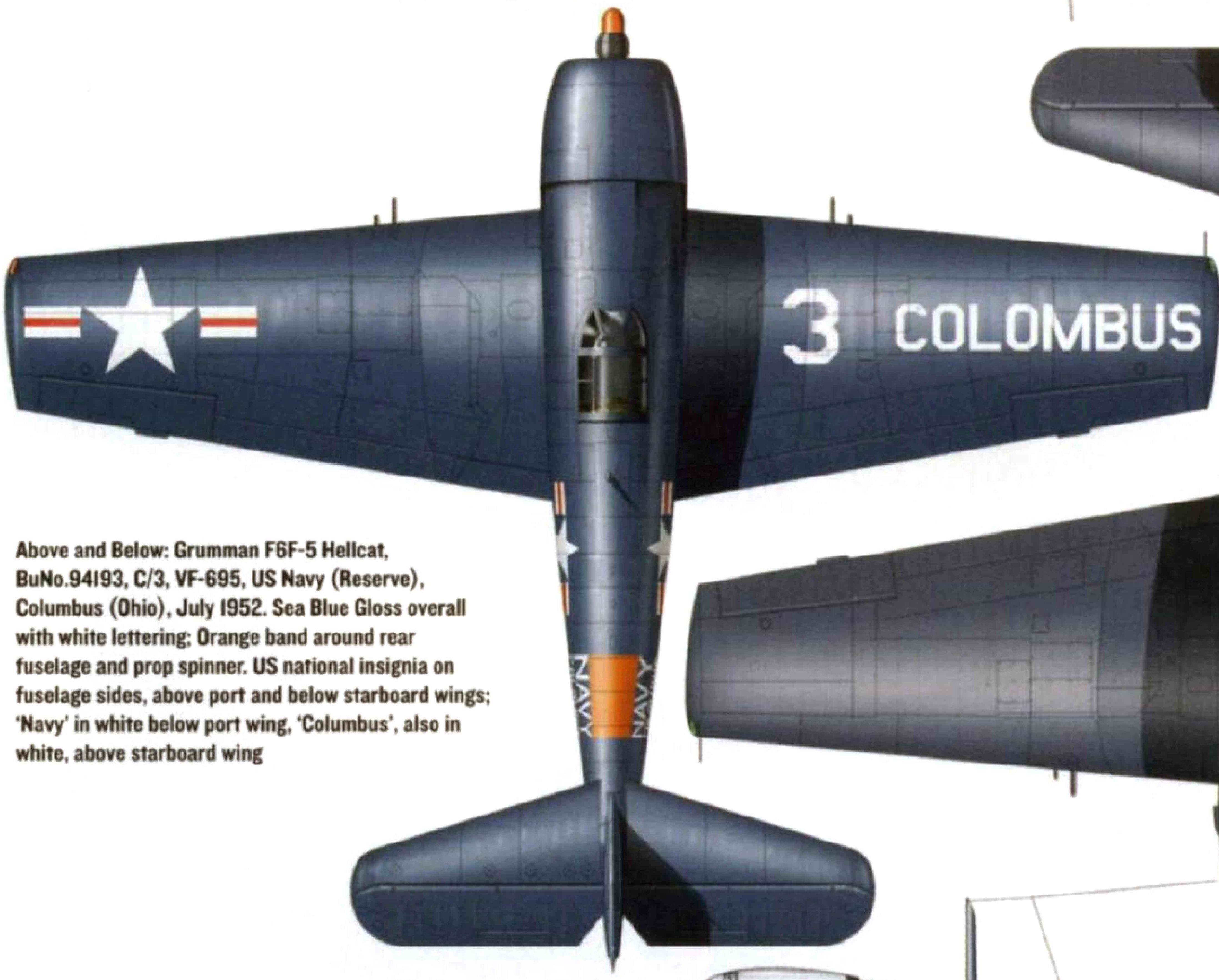
Grumman F6F-3, '00', flown by the Commander of Carrier Air Group (CAG) 5, 1942. Finish as above; US national insignia (outlined in red) on fuselage, top of port wing and below starboard wing; '00' in white on fuselage sides, repeated below tailplane in black. Diagonal white stripe on fin denotes CAG 5

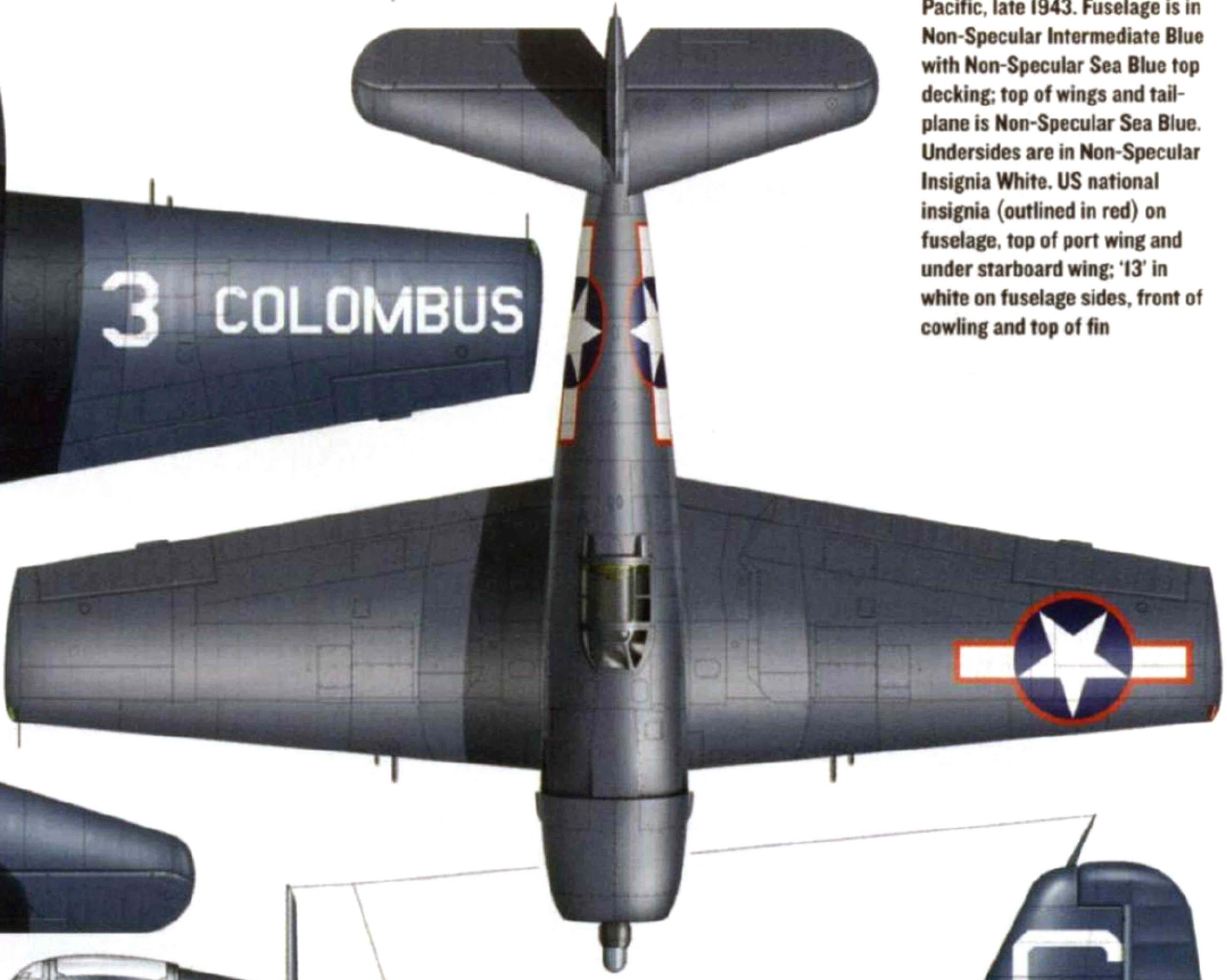


Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

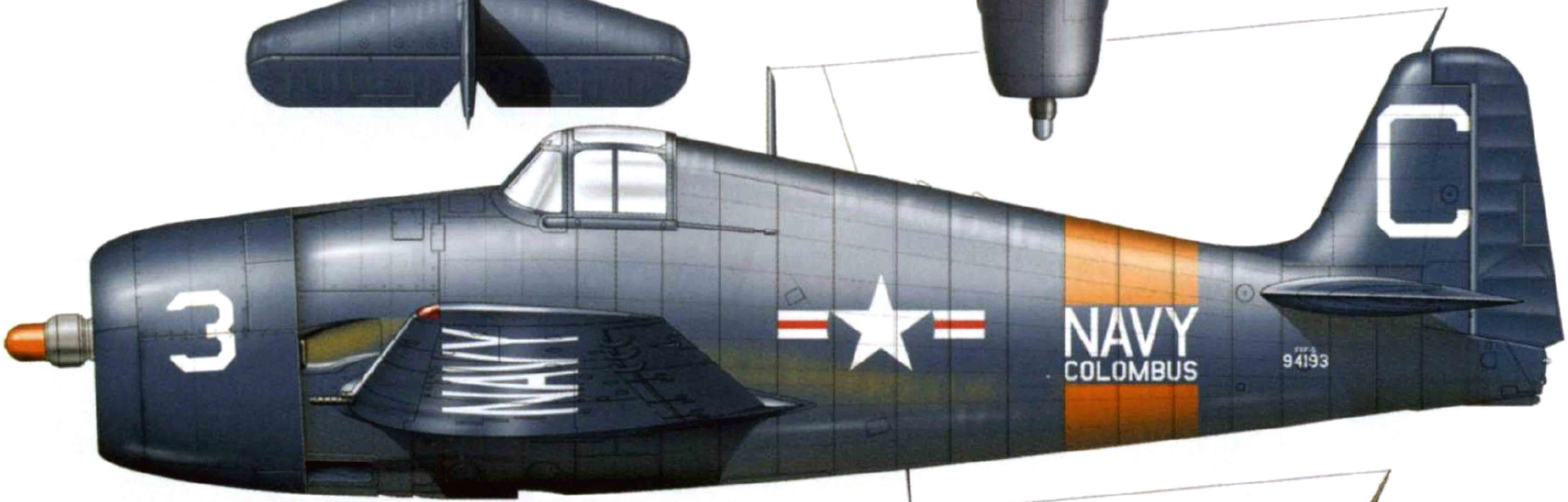


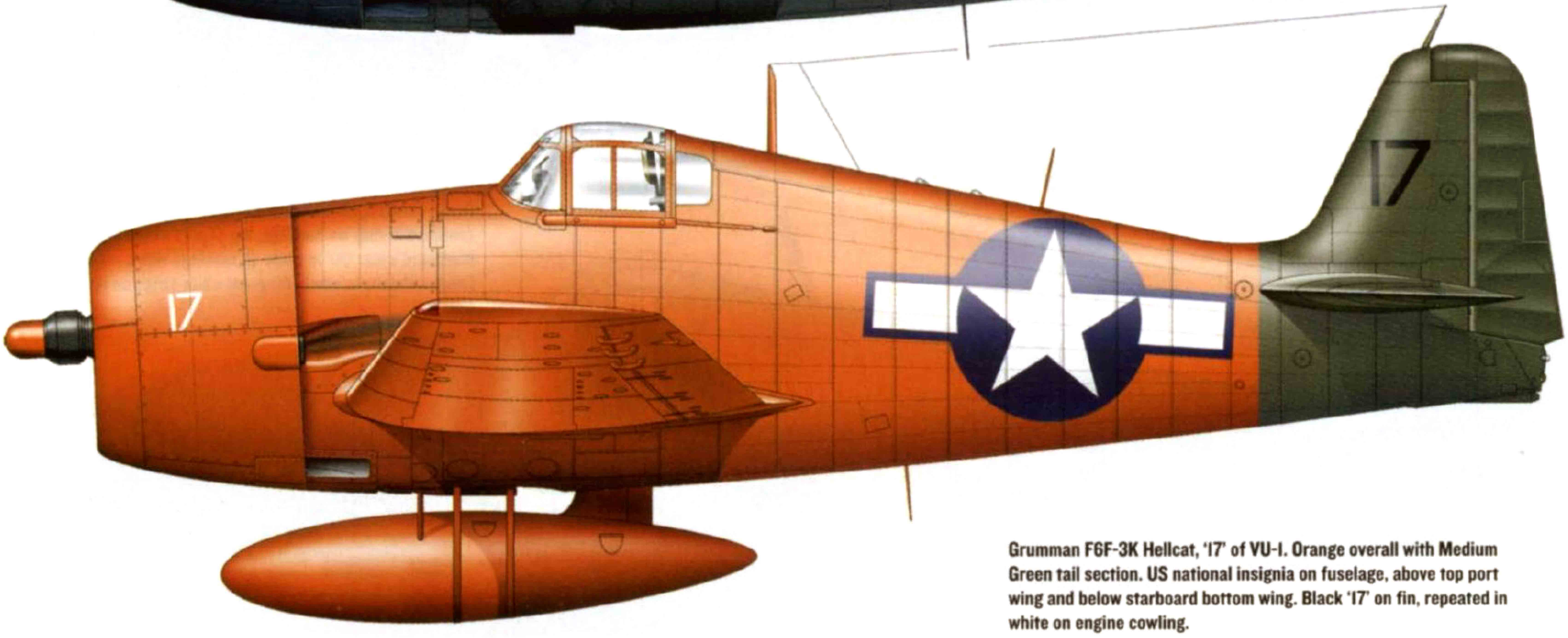
Above and Below: Grumman F6F-3 Hellcat, '13', VF-16, US Navy, on board *USS Lexington*, Pacific, late 1943. Fuselage is in Non-Specular Intermediate Blue with Non-Specular Sea Blue top decking; top of wings and tail-plane is Non-Specular Sea Blue. Undersides are in Non-Specular Insignia White. US national insignia (outlined in red) on fuselage, top of port wing and under starboard wing; '13' in white on fuselage sides, front of cowling and top of fin





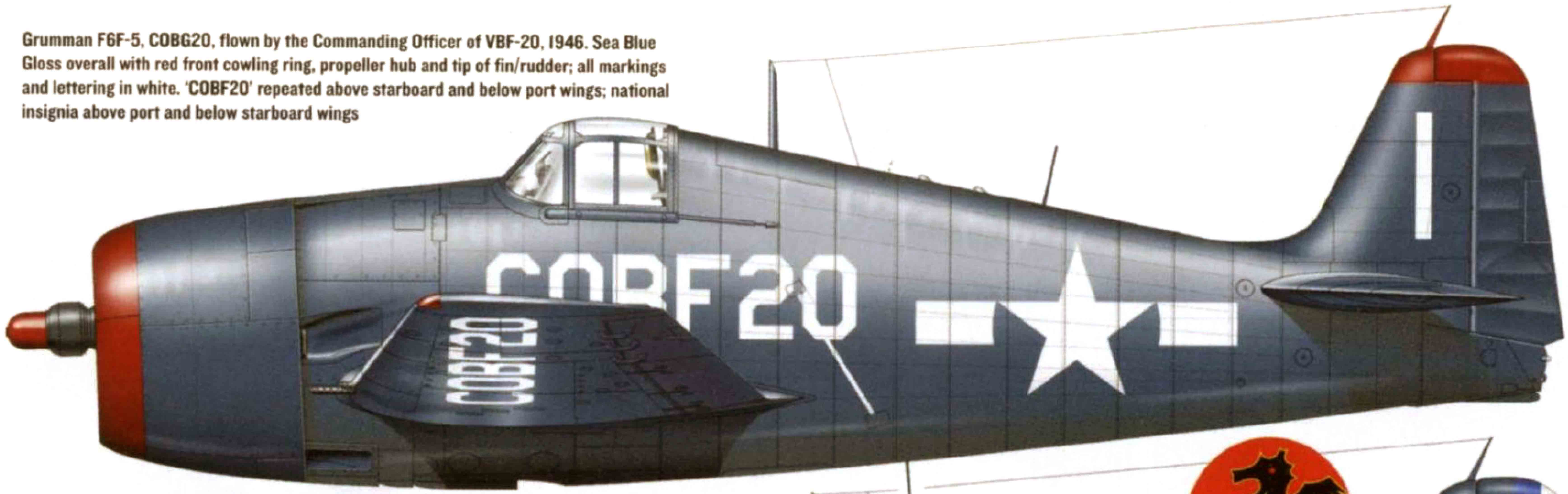
Above and Below: Grumman F6F-5 Hellcat, BuNo.94193, C/3, VF-695, US Navy (Reserve), Columbus (Ohio), July 1952. Sea Blue Gloss overall with white lettering; Orange band around rear fuselage and prop spinner. US national insignia on fuselage sides, above port and below starboard wings; 'Navy' in white below port wing, 'Columbus', also in white, above starboard wing





Grumman F6F-3K Hellcat, '17' of VU-1. Orange overall with Medium Green tail section. US national insignia on fuselage, above top port wing and below starboard bottom wing. Black '17' on fin, repeated in white on engine cowling.

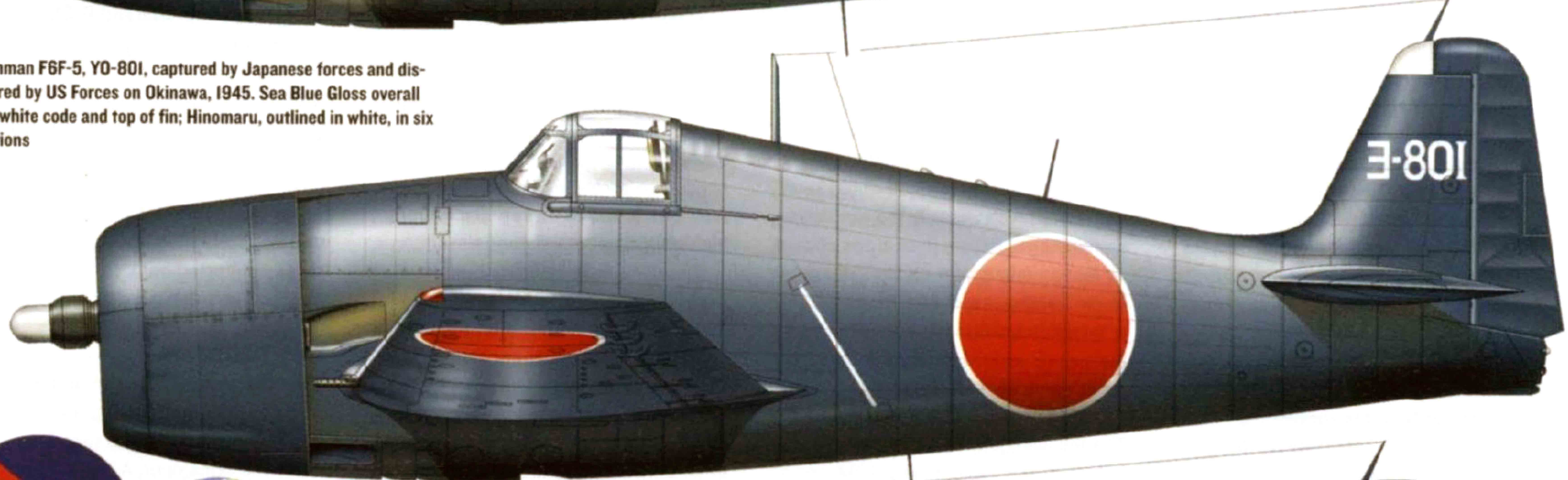
Grumman F6F-5, COBG20, flown by the Commanding Officer of VBF-20, 1946. Sea Blue Gloss overall with red front cowling ring, propeller hub and tip of fin/rudder; all markings and lettering in white. 'COBF20' repeated above starboard and below port wings; national insignia above port and below starboard wings



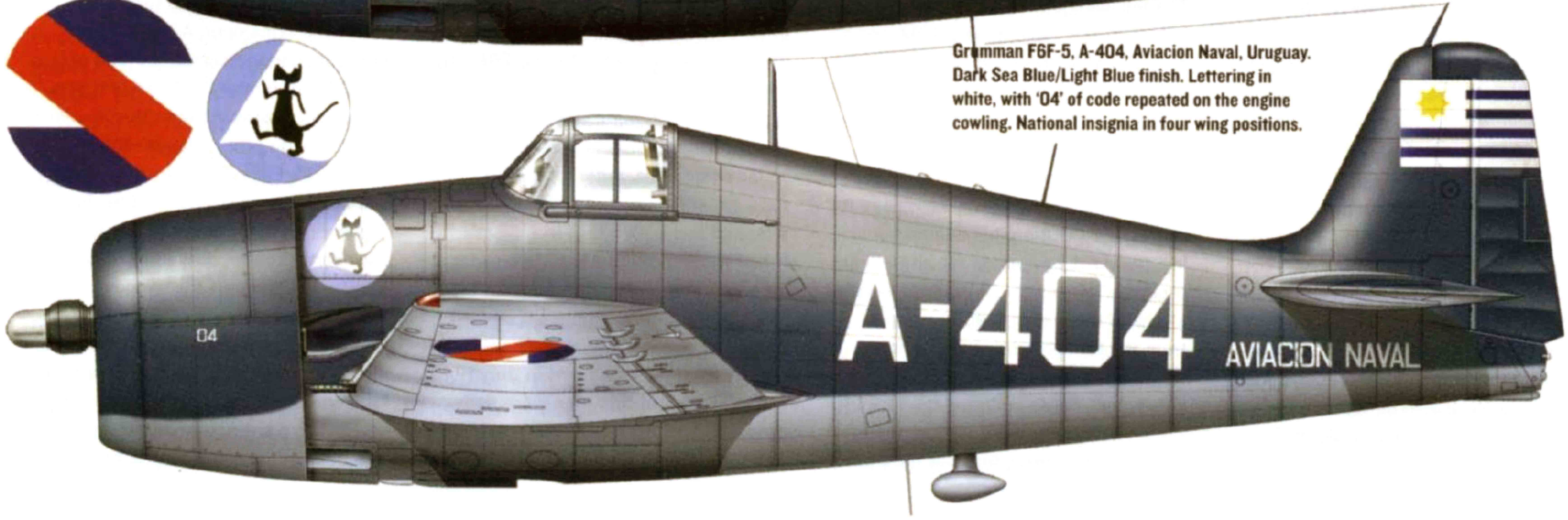
Grumman F6F-5, 809872/I.F.II, of Flotille I, Aéronavale, operating in Indo China, 1945. Gloss Sea Blue overall with red propeller hub. National markings in six positions, together with tricolour on rudder. Codes and serial in white; unit badge carried on fin, both sides

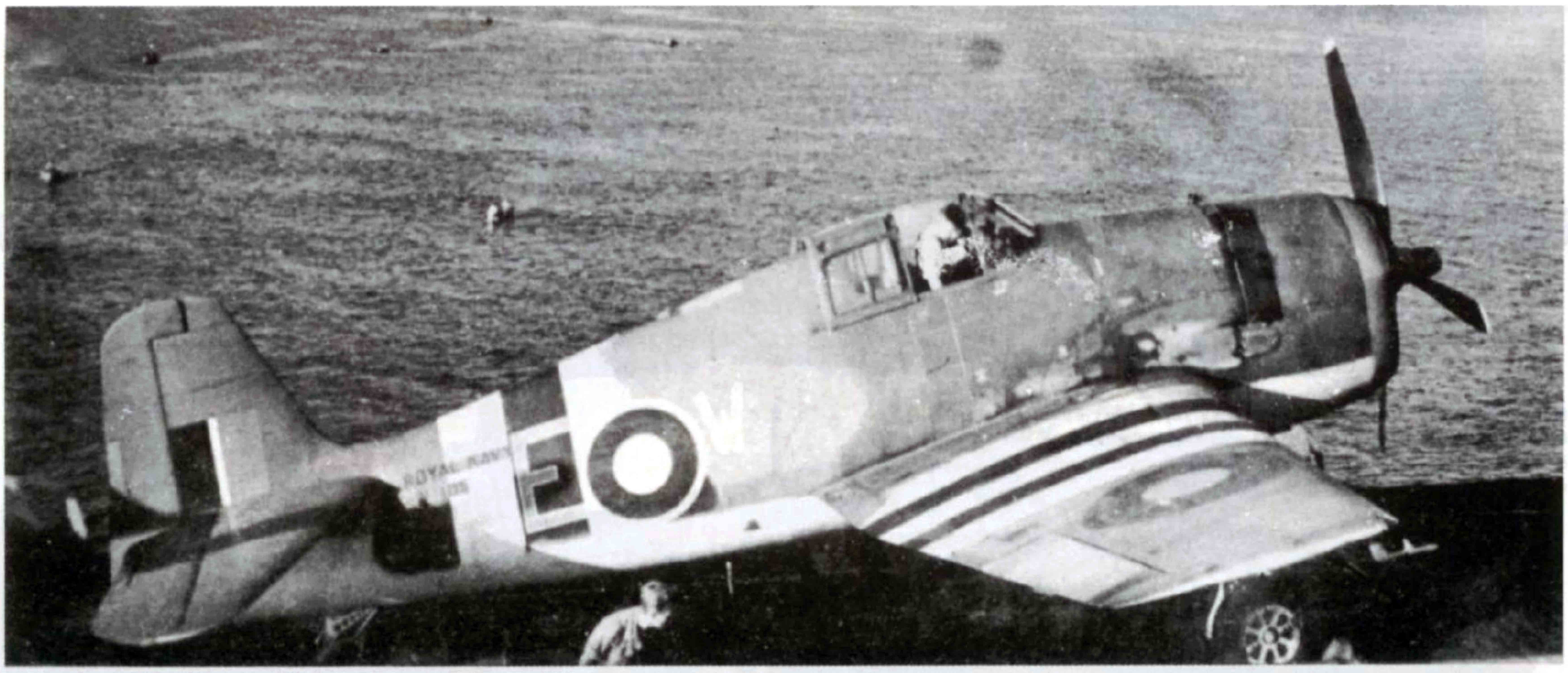
Grumman F6F-5, 'S', GC II/9 'Auvergne, Armée de l'Air, Tan Son Nhut, Vietnam, 1952. Sea Blue Gloss overall with white code over a black rectangle; national insignia in six postions. Unit badge carried on both sides of cowling

Grumman F6F-5, YO-801, captured by Japanese forces and discovered by US Forces on Okinawa, 1945. Sea Blue Gloss overall with white code and top of fin; Hinomaru, outlined in white, in six positions



Grumman F6F-5, A-404, Aviacion Naval, Uruguay. Dark Sea Blue/Light Blue finish. Lettering in white, with '04' of code repeated on the engine cowling. National insignia in four wing positions.





ABOVE: Hellcat Mk I, JV105, E•W of No.800 Naval Air Squadron photographed on board *HMS Emperor* cruising off the coast of Kyhos (Greece) in September 1944. This unit carried red codes, often outlined in either white or black and was also distinguished by the same colour applied to the propeller hub and front of the cowling (*R.J. Caruana Archives*)

LEFT: France used its F6F-5 Hellcats with both the air force and navy. 968/54.S.4 is an example in service with the Aéronavale and a number of these aircraft were used in Indochina (*R.J. Caruana Arvchives*)

could be supplemented by a 150 US gallon external drop tank fitted centrally beneath the fuselage. The new fighter weighed 9,024lb empty and 12,186lb loaded. A maximum speed of 376 mph could be achieved, with an initial climb rate of 3,240 feet per minute. It had a service ceiling of 37,500ft and a range, on internal fuel, of 1,090 miles.

INTO SERVICE

VF-9 on board the *USS Essex* became the first USN unit to receive the first production F6F-3 Hellcats on 16 January 1943. Grumman's production of the Hellcat went into high gear and by the end of that year they had delivered 2,555 examples. This enabled a considerably number of USN F4F Wildcat units to convert to the F6F-3 within very short period, although the first taste of action did not come until the summer of that year.

It was VD-5 that took the Hellcat into battle for the first time, operating from *USS Yorktown* as part of Task Force 15, on 31 August 1943. Later that same day, VF-9 also participated in the strike against Marcus Island. The F4U-1 Corsair had already been used in action some six months previously, though from a land base, whereas the F6F-3 began its career flying from the enviroment it had been created for, the aircraft-carrier. By the end of 1943, the Hellcat was virtually the exclusive equipment of fighter squadrons aboard all fast and light USN carriers operating in the Pacific. It was also the mount of a considerable number of USN fighter aces, such as Lt J.G. Ralph Hanks who, on 23 November 1943, managed to shoot down five A6Ms in five minutes. The following day further air battles between USN Hellcats and A6M Zeros ended in one F6F-3 lost for 30 enemy fighters shot down.

Early in 1944, 60 percent of F6F-3 production was being fitted with the R-2800-10W, which, with water injection for emergency power increased its power to 2,200hp. This engine becoming standard equipment for all Hellcats produced after April 1944. That month also saw the last of 4,402 examples from the first -3 production variant, which had also included a number of sub-types. These included the F6F-3P, -3E and -3N. The F6F-3P had a long focal length camera fitted in the fuselage just aft of the wing trailing edge, provided with windows on either side. These windows were protected from being clogged up by engine exhaust emissions 'arrowhead' fairings and the type was found to be very useful for high altitude photo-reconnaissance.

The 18 F6F-3E Hellcats built had early versions of the AN/APRS-4 radar installed within a fairing attached to the starboard wing. Night vision from the cockpit was considered to be rather poor although this was somewhat corrected with the installation of a flat-fronted windscreen. They were soon superseded by the F6F-3N, which eventually became the standard radar-equipped night fighter version of the Hellcat. The extra weight of the radar equipment, together with the drag generated by the radome, meant a loss of some 16mph in top speed. It had the improved AN/APS-6 radar mounted in a similarly manner to the -3E and the first example (XF6F-3N) beginning flight trials at Quonset Point shortly after its first flight in July 1943. 149 examples of this type were delivered, the F6F-3N having its operational debut operating from USN carriers in November 1943 during the occupation of the Gilbert Islands.

Meanwhile, the XF6F-2 that had flown for the first time on 7 January 1944. This was basically an F6F-3 fitted with a turbo-charged R-2800-21 engine, the turbocharger system being housed in a deeper fuselage. The XF6F-4 designation was used for the XF6F-1 modified to take the R-2800-27 engine that was fitted with a single-stage, two-speed surpercharger. Its first flight was on 2 October 1942, but with no production order forthcoming it was converted back to full F6F-3 standard and delivered to the USN.

THE DEFINITIVE 'CAT'

Grumman was by now concentrating on improving the Hellcat, primarily in providing it with more speed and increased armament. A 'cleaned-up' F6F-3 managed to clock 410mph at 21,000ft in January 1944 and most of the modifications made to this machine, together with other changes introduced on the F3F-E/Ns, formed the basis for a second major variant, the F6F-5. The main exterior features included the deletion of the curved front windscreen, blanking off the windows aft of the cockpit canopy, installation of red instrument panel lighting, a redesigned close-fitting engine cowling, spring tabs on the ailerons, an additional 30lb of armour, a strengthened tail section and built-in provision for the carriage

F6F-5 Hellcats aboard *USS Randolph* belonging to VF-8, carrying the carrier's code letter 'L' on their fin and starboard wing tip. The picture was taken in the summer of 1945 and the unit was decommissioned in November of that same year (*U.S. Navy*)

"The Hellcat has many claims to fame, not least of which is the fact that it bagged 4,947 of the 6,477 aerial victories claimed by USN carrier pilots during the Second World War"

of rockets and bombs under the wings and fuselage.

The weight of the F6F-5 was 9,238lb empty, 12,740lb normal and 15,314lb maximum. Top speed had now risen to 380mph at 23,400ft, while initial climb rate was 3,500ft per minute. This performance gave the new version an edge over the A6M5 of 45mph at 10,000ft, rising to 75mph at 25,000ft – the higher speed more than made up for the A6M5's superior manoeuvrability. Initially the wing armament remained the same as that of the F6F-3, although a 20mm cannon replaced the inboard machine guns on each side with late production models. These cannon could fire up to 200 rounds each and a total of 1,000lb of bombs could also be carried. Alternatively, three stub pylons under each wing allowed for the fitment of six 0.5inch 'high velocity air rockets' (HVAR).

During the two days of the Battle of the Philippine Sea (19-20 June 1944), the Hellcat became a living legend when it shot most of the Japanese opposition out of the sky. On the first day, Hellcats were despatched at 10.00am to provide fighter cover as radar had picked up a mass formation moving towards the American fleet. Of the 69 enemy aircraft in the first wave, 42 were shot down. During the second strike, only 20 enemy aircraft out of 128 managed to pass through the American fighter cover, and of this total only 30 returned. By the end of the Battle, USN Hellcats had shot down the bulk of 300 enemy aircraft destroyed. This accomplishment became known as the 'Great Marianas Turkey Shoot'.

The -5 was also built as a night fighter as the F6F-5N and it carried the same radar equipment as the -3N. Thanks to its superb performance it was supplied to several nightfighting units in the Pacific, in one case even replacing the P-61 Black Widow at Leyte. It was also the sub-variant to be built in the largest quantity, 1,434 examples being built.

HELLCATS FOR THE FLEET AIR ARM

During 1943, the Royal Navy began to receive the first of 252 Hellcats under Lend-Lease. On joining the first units of the Fleet Air Arm (FAA), the F6F-3 was initially known as the Gannet but Hellcat was soon adopted in an effort to standardise names of those aircraft supplied by the US to Britain.

Preliminary trials were conducted in Britain with FN323, while FN322 was used for performance flight tests between July and August 1943. A third, FN331, joined the test programme during that period with the three aircraft carrying out some 100 hours in 61 flights each. Engines were changed after 60 hours and the main criticism centred around the lack of pilot comfort, the seat becoming uncomfortable after 1.5 to 2 hours, while the harness was found to be difficult to adjust. FN344 was later tested in February 1944 with four rocket projectile rails under each wing.

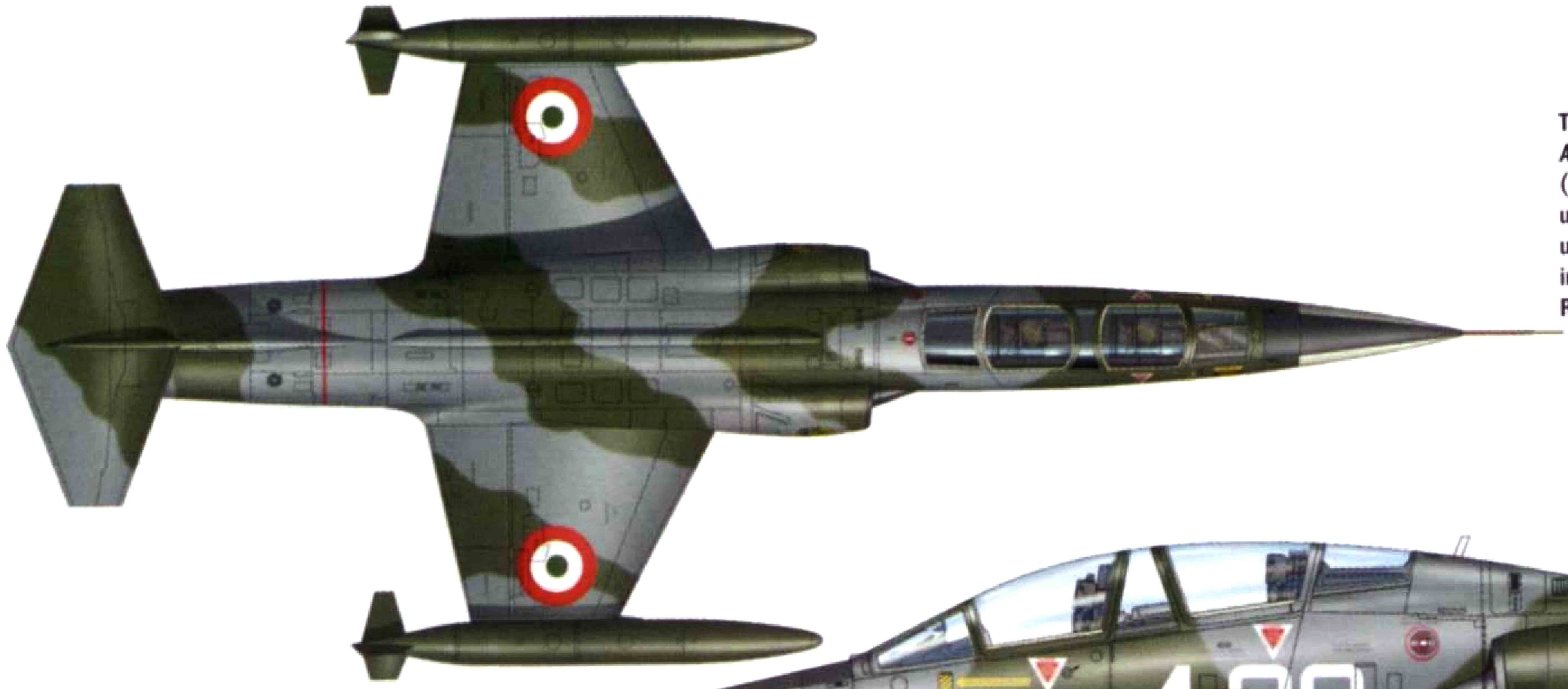
The first of 252 Hellcat Mk Is went to re-equip No. 800 Naval Air Squadron (NAS) in lieu of the Sea Hurricanes Mk II in July 1943. Towards the end of the year, the unit embarked on *HMS Emperor* as part of No. 7 Naval Fighter Wing, and in April 1944 provided fighter escort for other aircraft attacking the *Tirpitz*. It had also performed a number of anti-shipping strikes off the Norwegian coast as early as December of the previous year. No. 804 NAS received its Hellcats in August 1943, but these were absorbed on 18 June 1944 into No. 800 NAS, which saw its complement rise from 10 aircraft to 20. Later that year the unit sailed to the Mediterranean to participate in the invasion of southern France.

More NAS units began to re-equip with the Hellcat, some also changing their Mk Is for the Mk IIs, the latter being the equivalent of the -5. Apart from those already mentioned these include Nos. 808, 881, 888, 889, 896, 898, 1839, 1840, 1844 and 1847.

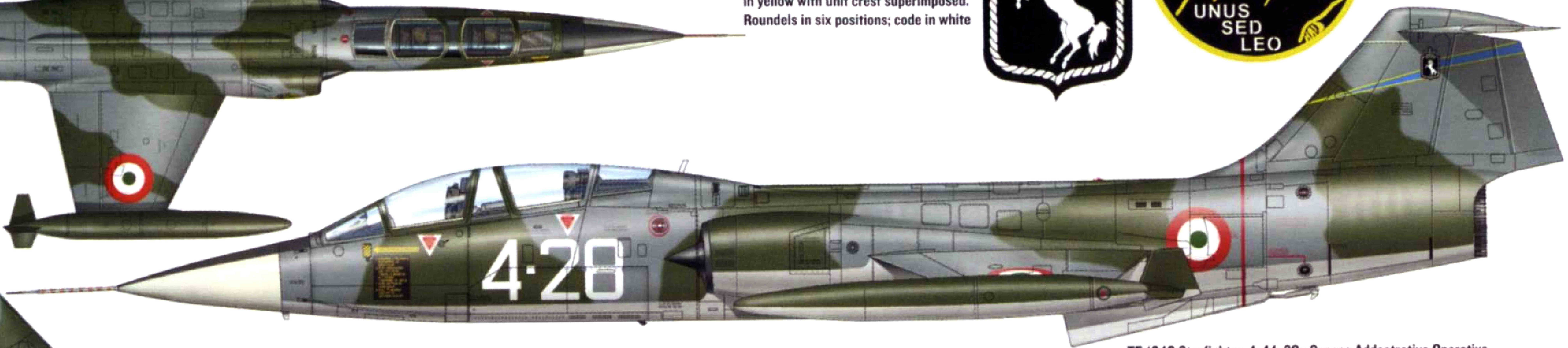
The FAA also received a number of F6F-5Ps which were redesignated FR Mk II, while Nos 891 and 892 NAS were equipped with F6F-5Ns, which in British service became known as NF Mk IIs. The bulk of Mk IIs saw service with the British Pacific Fleet in the Far East until VJ-Day. On their first major large-scale operation against Japanese forces, these Hellcats attacked oil refineries in Sumatra. The type also began to replace the Martlet (F4F) on board the light escort carriers and in all, 1,262 Hellcats were delivered to the FAA.

Before production of the Hellcat came to an end in November 1945 after a grand total of 12,274 examples had been built, Grumman conducted a series of experiments, including the installation of variants of the R-2800 engine. The XF6F-6, which flew for the first time on 6 July 1944, was powered by the R-2800-18W rated at 2,100hp, which could be boosted to 2,450hp using water injection. This became the fastest version of the Hellcat, attaining a maximum speed of 417mph at 22,000ft, however the F6F-6 never entered series production. With the surrender of Japan, the 1,677 -5s still on order were cancelled.

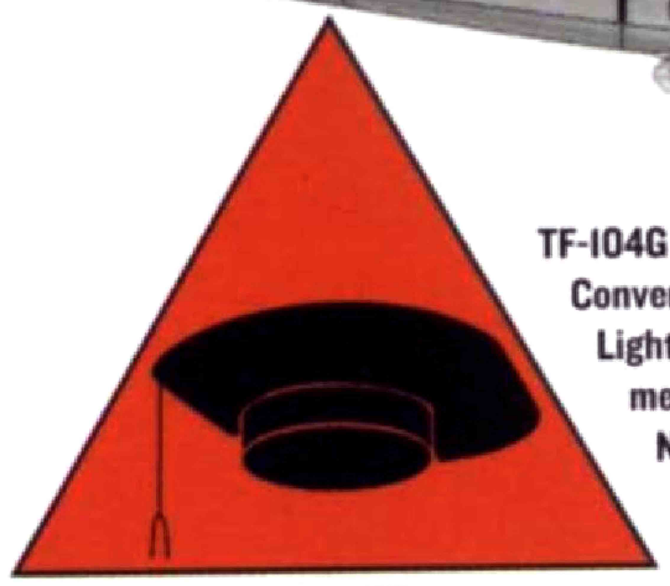
The only other nations to operate the Hellcat were France and Uruguay. The former received about 120 Hellcats and these were operated by both the Armée de l'Air and Aeronavale in Indochina during the early 1950s. The small number of Hellcats supplied to Uruguay continued to fly until retired from service in 1961. ■



TF-104G Starfighter, 4-28, 4º Stormo, *Aeronautica Militare Italiana*. Dark Grey (FS 36152) and Dark Green (FS 34079) upper surfaces with Light Silver-Grey undersides; blue flash on fin outlined in yellow with unit crest superimposed. Roundels in six positions; code in white



TF-104G Starfighter, 4-44, 20o Gruppo Addestrativo Operativo, *Aeronautica Militare Italiana*, based at Grosseto. Similar finish to above; 4º Stormo badge on fin and unit badge on air intake (lion and prancing horse facing forward on port side). Codes in light blue, outlined in black



TF-104G Starfighter, D-5811, 'The Dutch Masters' Operational Conversion Unit, Royal Netherlands Air Force, Twenthe AFB. Light Grey overall except for rear fuselage, which is natural metal. National markings in six positions; codes in black. Note 'The Dutch Masters' painted underneath code on fin

Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006

TF-104G Starfighter, 22278/TF-278, Hellenic Air Force. Dark Green (FS 34064), Medium Green (FS 34012) and Tan (FS.30219) upper surfaces with Light Gray (FS 36633) undersides. National markings in six positions; black serial, code and radome

Profiles 1:72 Scale

0 METRES 1 2
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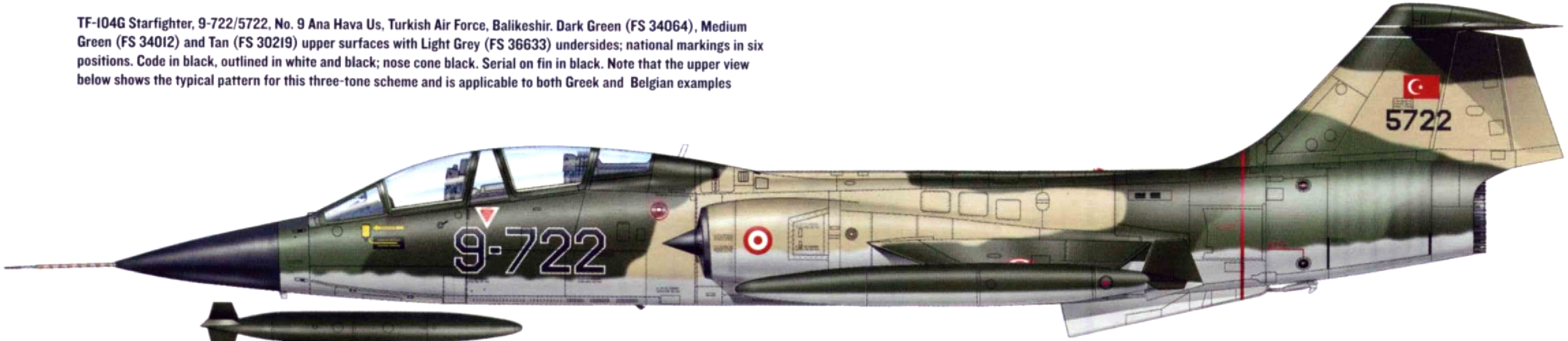
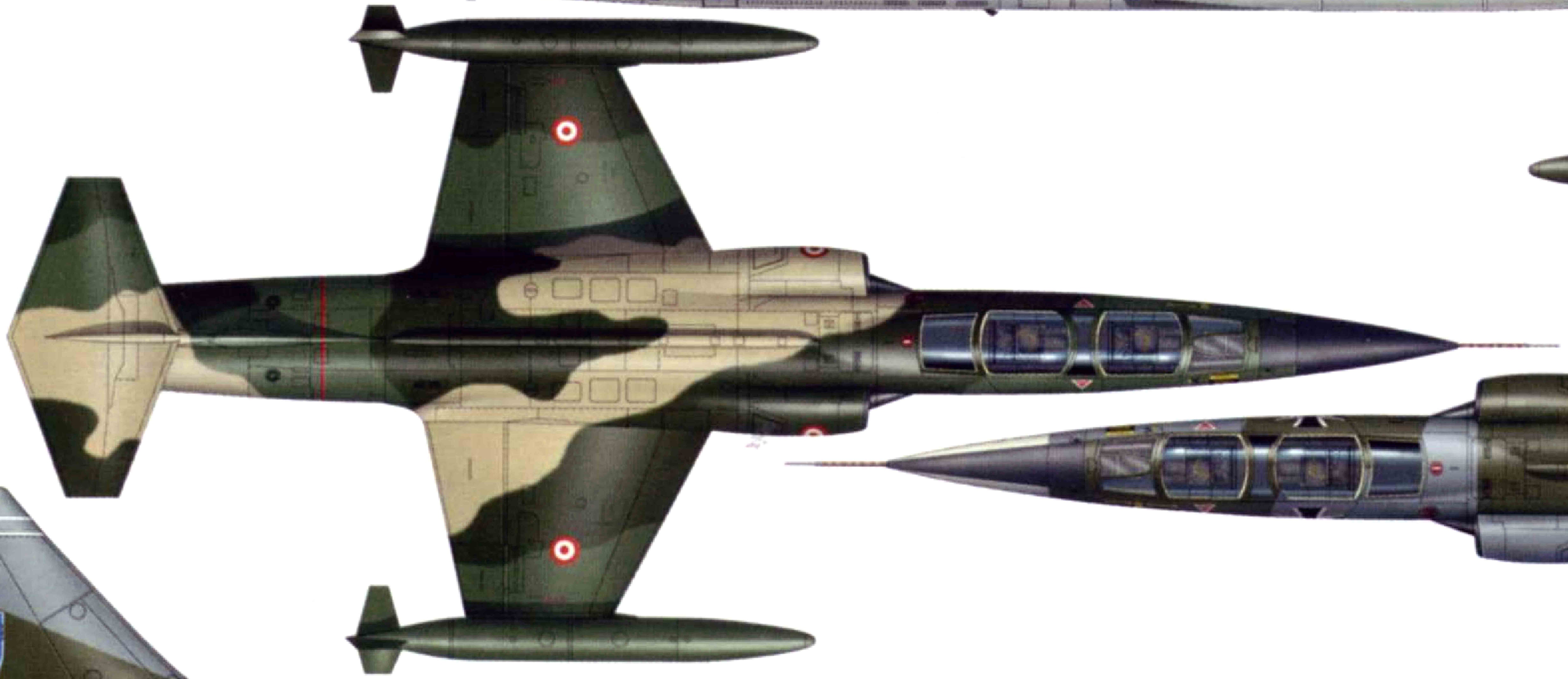
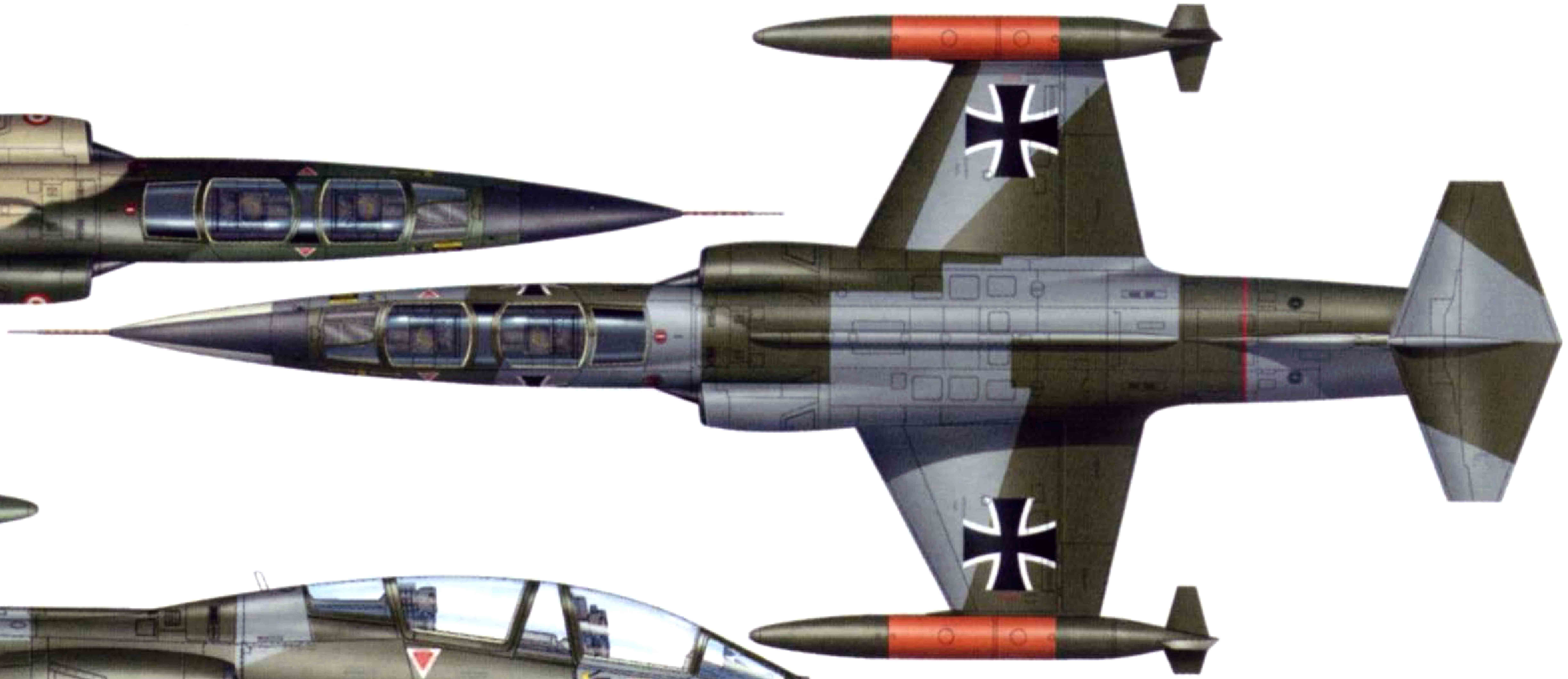
TF-104G Starfighter, 9-722/5722, No. 9 Ana Hava Us, Turkish Air Force, Balikeshir. Dark Green (FS 34064), Medium Green (FS 34012) and Tan (FS 30219) upper surfaces with Light Grey (FS 36633) undersides; national markings in six positions. Code in black, outlined in white and black; nose cone black. Serial on fin in black. Note that the upper view below shows the typical pattern for this three-tone scheme and is applicable to both Greek and Belgian examples

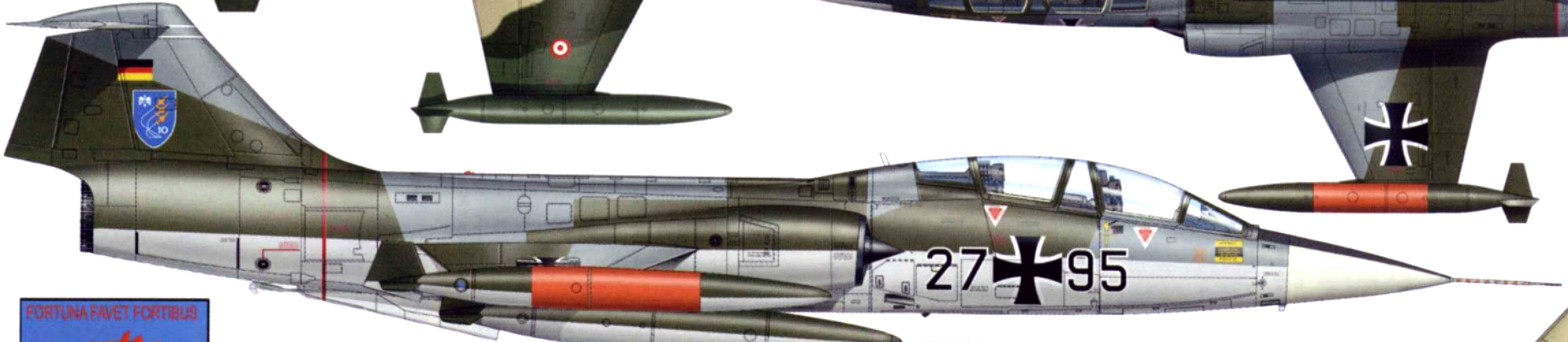


TF-104G Starfighter, 27+10, I/WS-10, Luftwaffe, Jever, 1977. Basaltgrau RAL 7012 (FS 26152*) and Gelboliv RAL 6014 (FS 34079*) upper surfaces with Silbergrau RAL 7001 (FS 26373*) undersides; national markings in standard six positions. Centre section of wing tip tanks in Dayglo Orange; unit badge on both sides of fin. Upper surface camouflage pattern is shown at far right

* All FS numbers quoted are approximations only







Profiles 1:72 Scale

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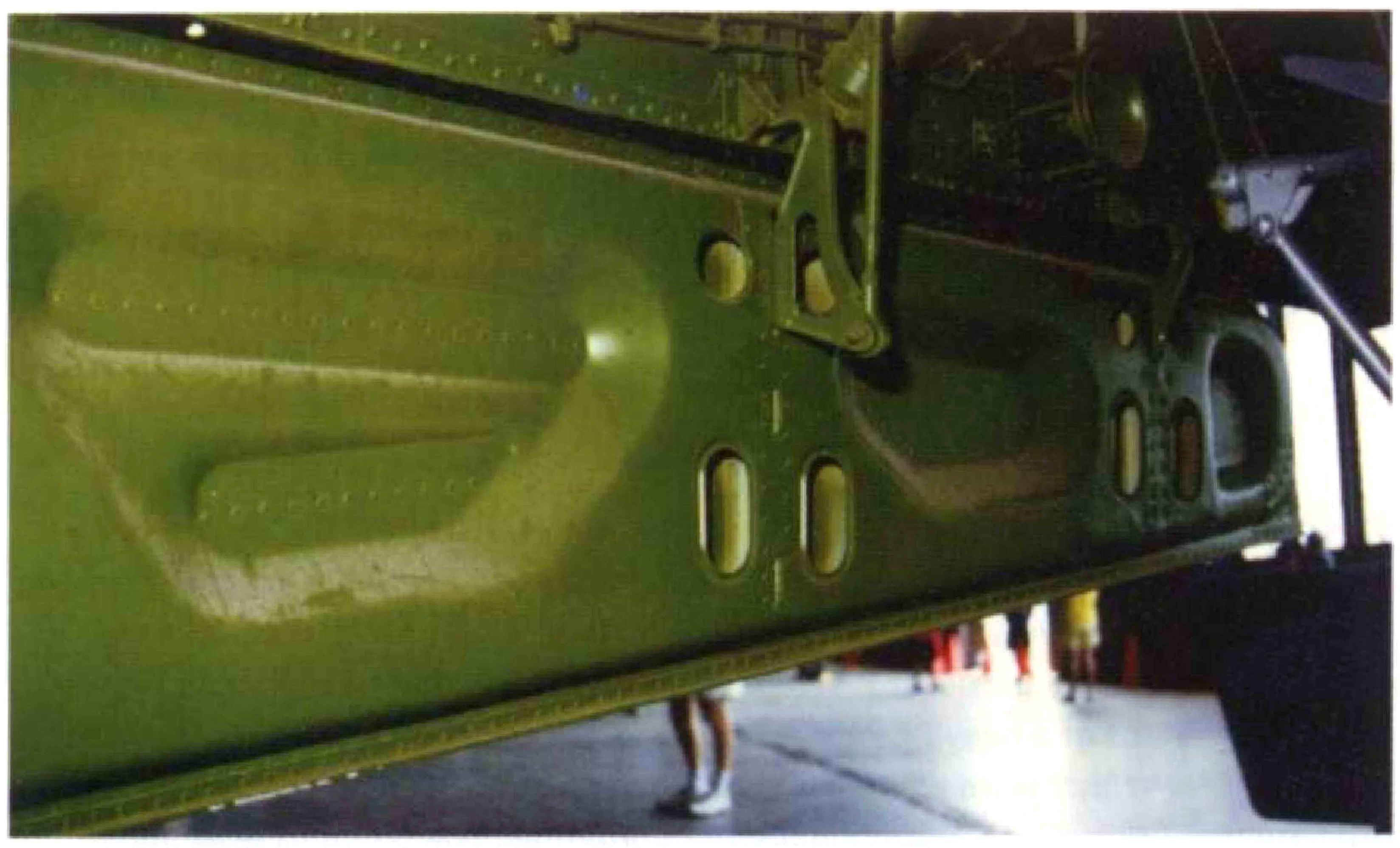
TF-104G Starfighter, FC11, 32 Smaldeel, 10 Wing, Belgian Air Force, June 1977. Dark Green (FS 34064), Medium Green (FS 34012) and Tan (FS 30219) upper surfaces with off-white (FS 36622) undersides; roundels in four wing positions. Codes in white; unit badge on fin both sides

PHOTO FEATURE - A-26K

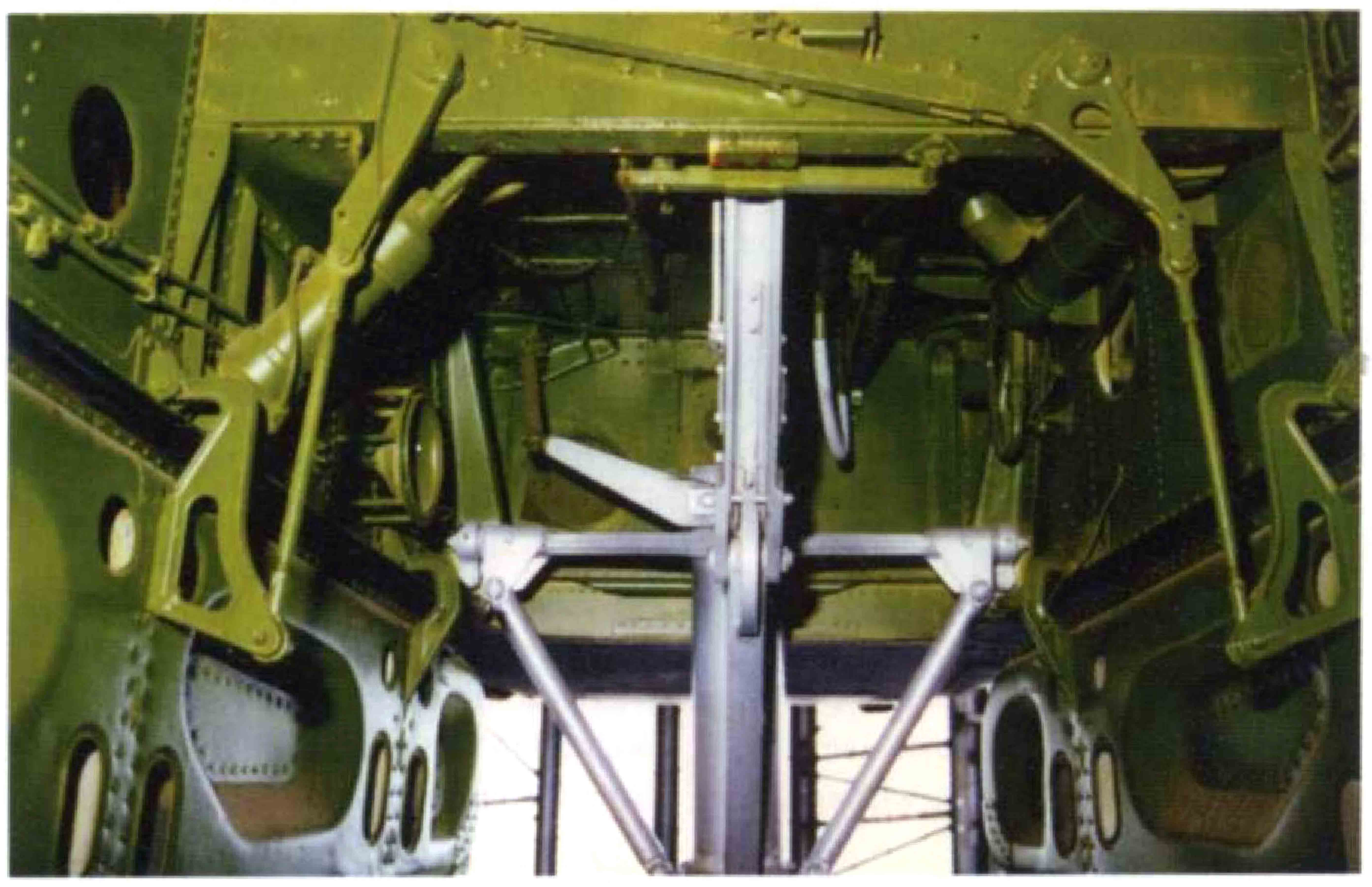
All photos © Richard A. Franks

This selection of images shows the A-26K owned by the USAF Museum at Wright-Patterson AFB. When these photos were take in 1997 this airframe was housed within the Annex alongside the main museum building, but today we are led to believe that it is now on show in the main museum complex.

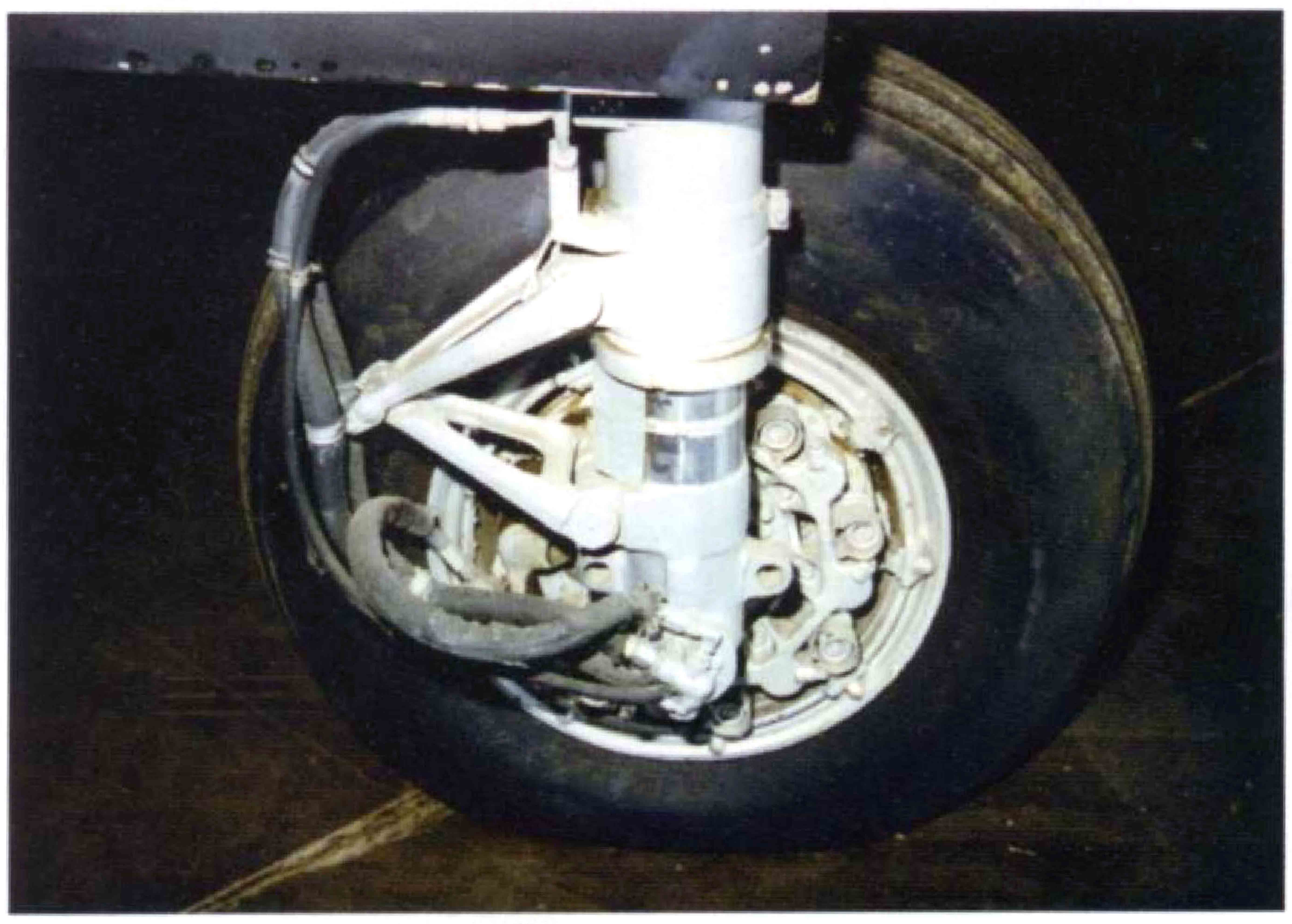
The nose oleo and wheel, viewed from the front. You can see the compression linkage and the small box on the side, just above it, which we presume has something to do with the retraction sequence of this oleo?



Closer view of the structure of the nose wheel doors

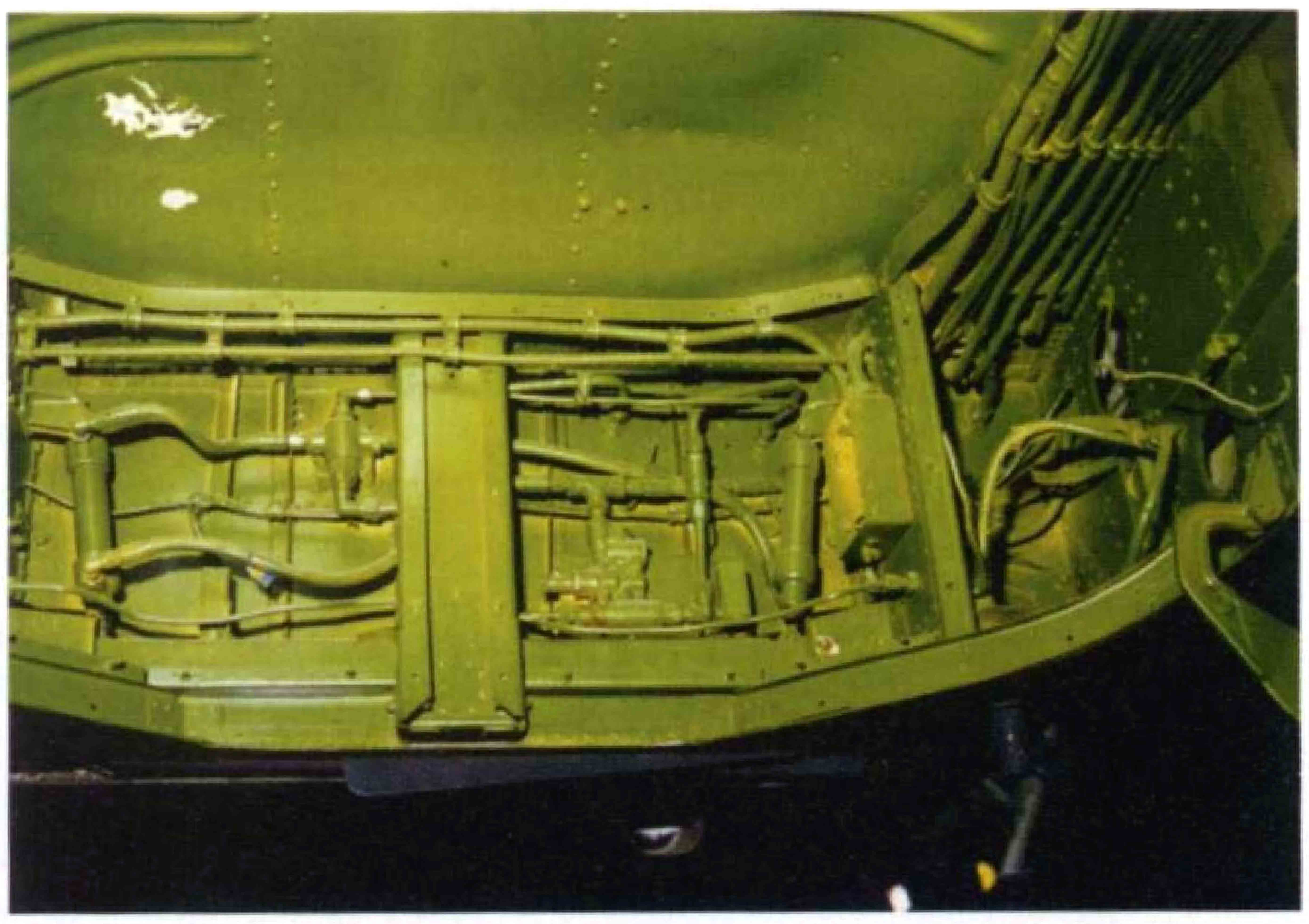


Up inside the nose wheel well, looking forward, you can see the single hydraulic ram on the port side that via linkage closes both doors

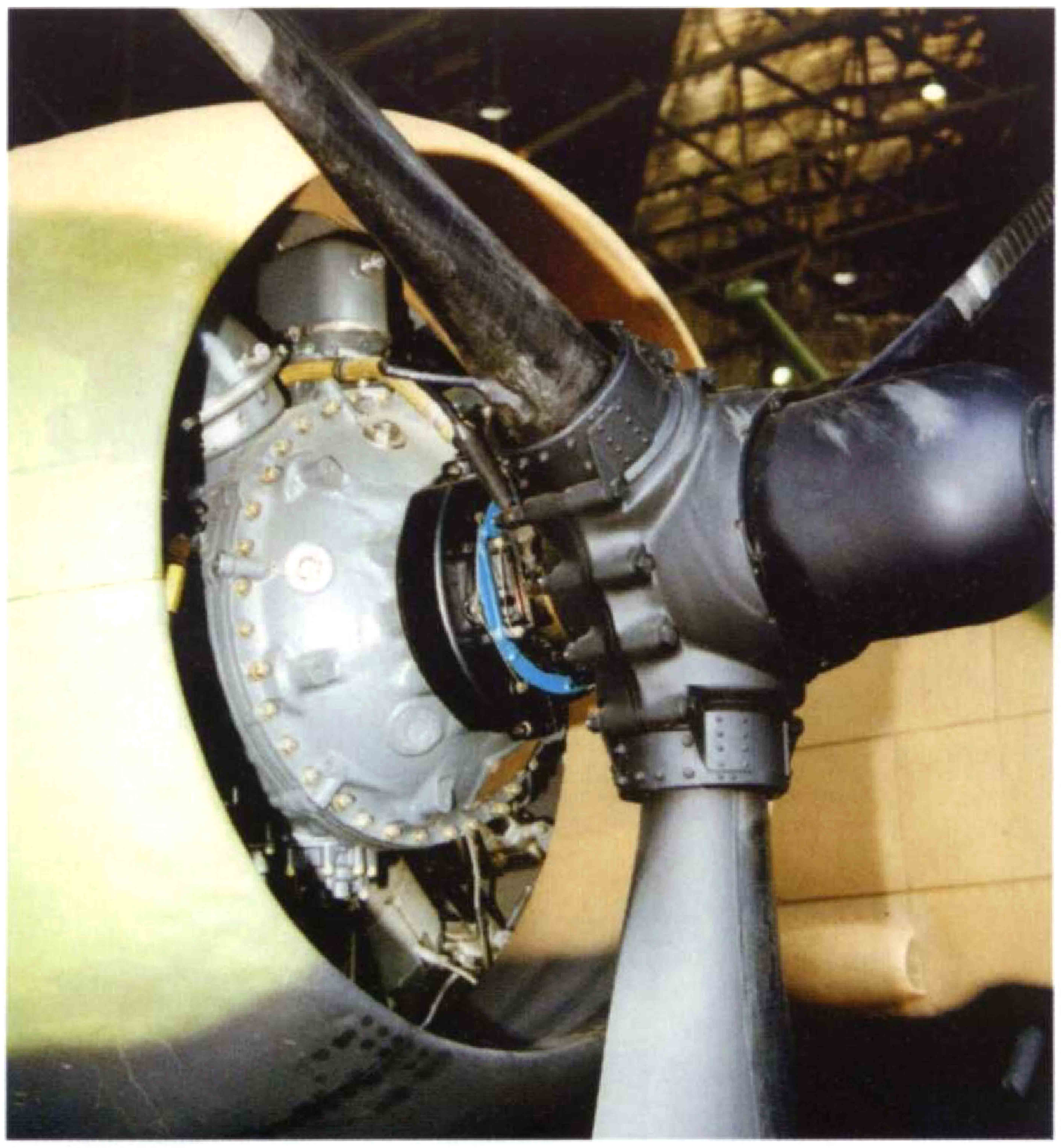


There are some pretty substantial brakes fitted to each main wheel

A close look at the structure of the inner faces of the main undercarriage doors

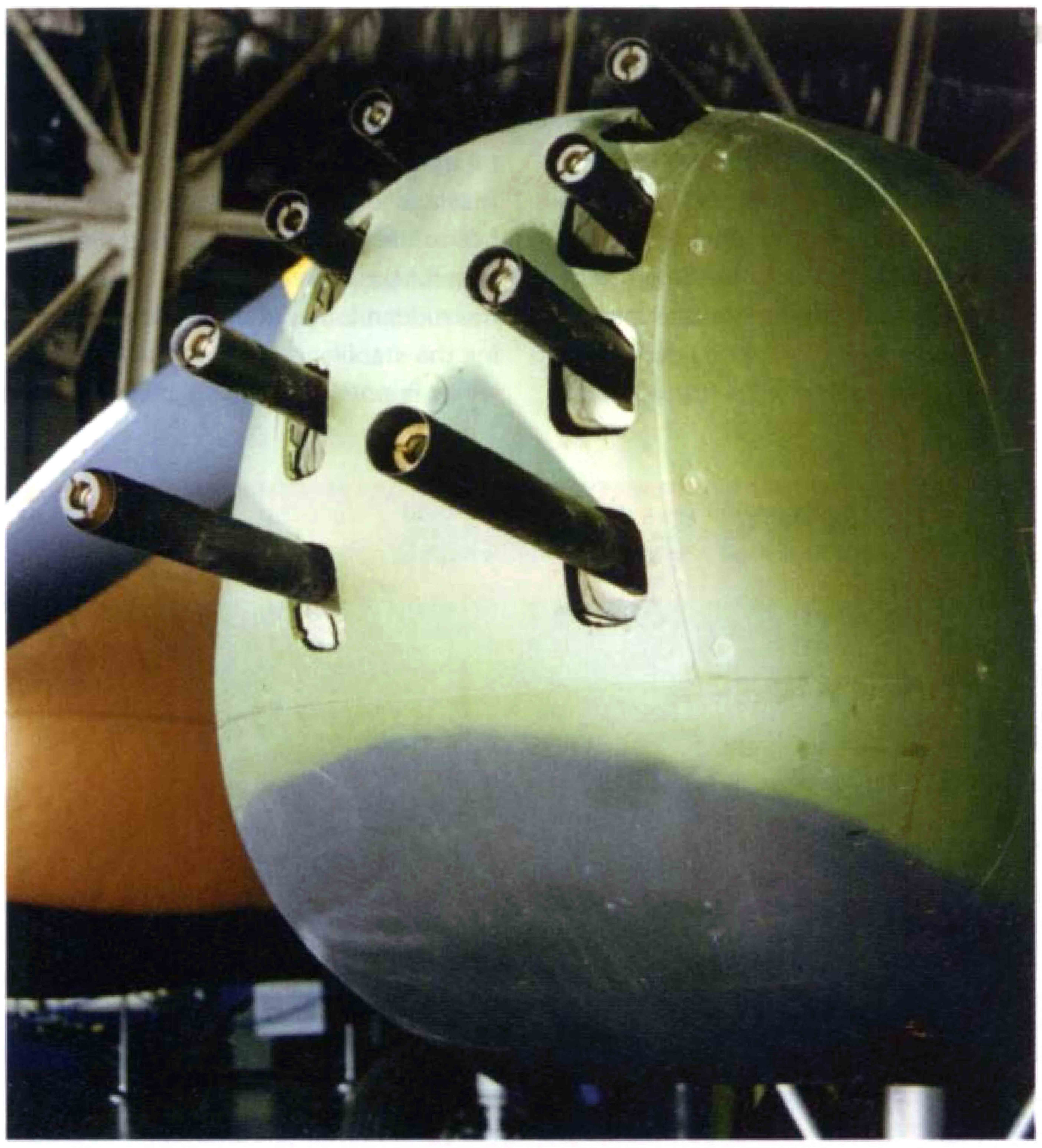


This is up inside the nose wheel well looking aft. This is why we think that little box on the nose leg must instigate the lower section of the oleo rotating through 90°, as this well is not deep enough to house the wheel if it just retracts backwards without rotating as well?



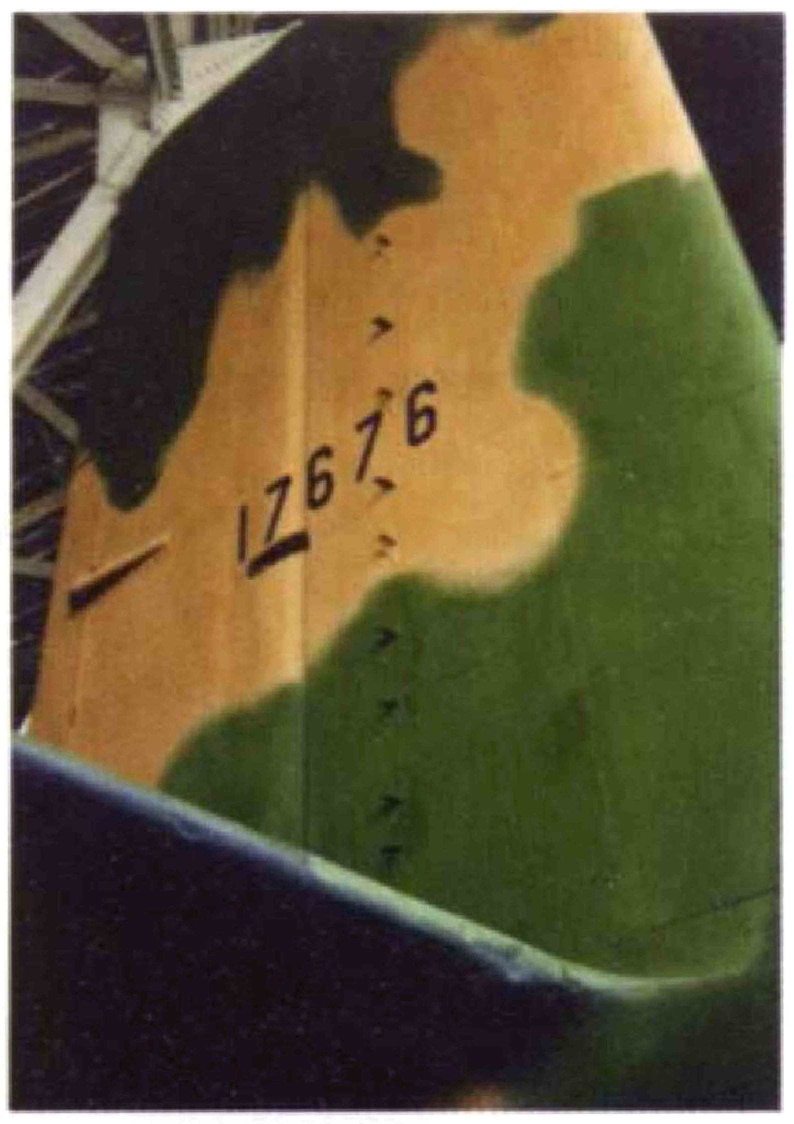
A good shot of the engine and cowling, something that Italeri did not get right in their kit

One of the underwing pylons, fitted with a rocket launcher. The overall finish is black, but as you can see it is really a very, very dark grey

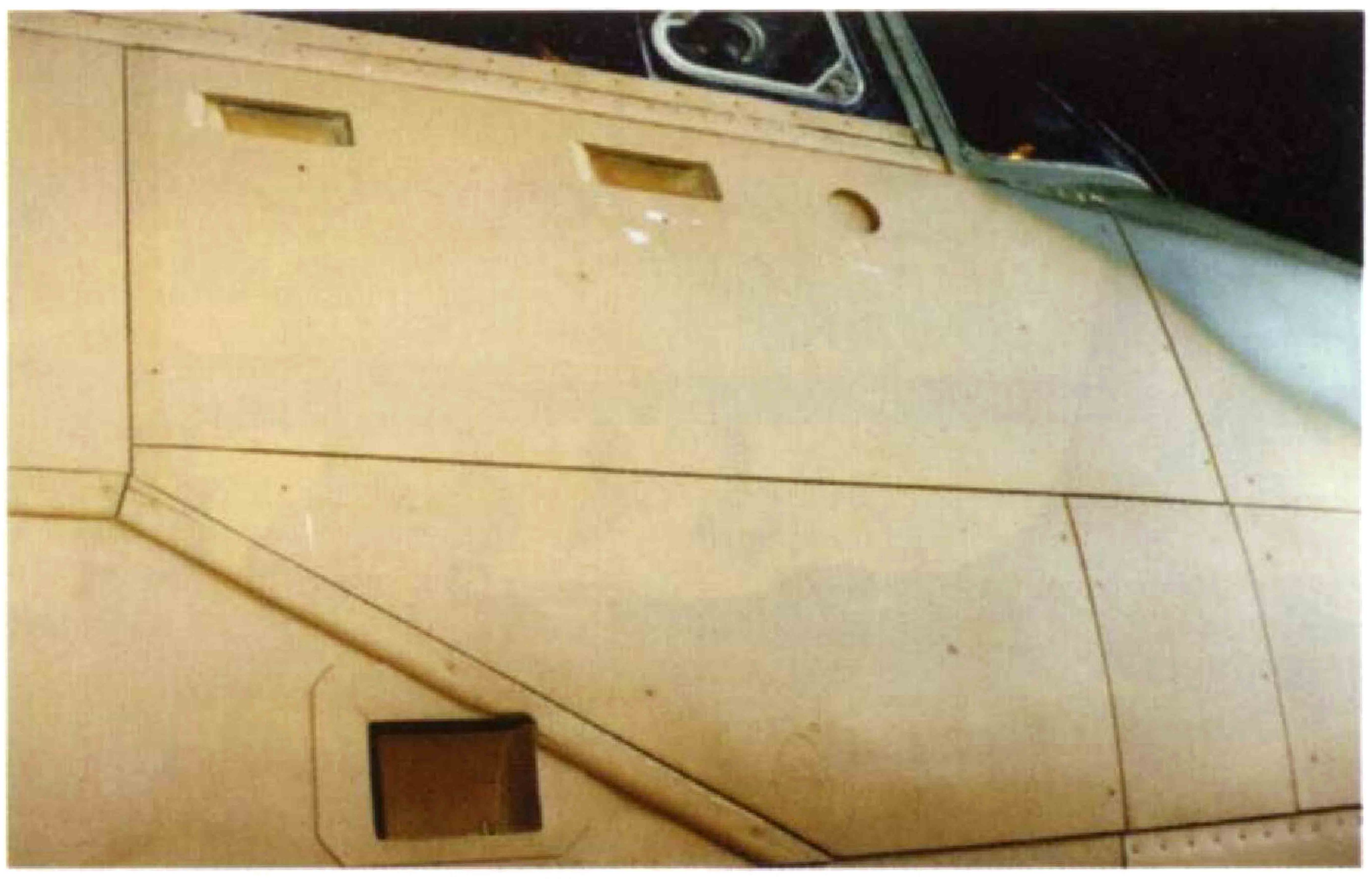


The eight-gun nose

This is the rather plain rear of the main wheel well



The vertical fin, complete with little plates (vortex generators) to create 'dirty' air to make the rudder and trim tab more effective

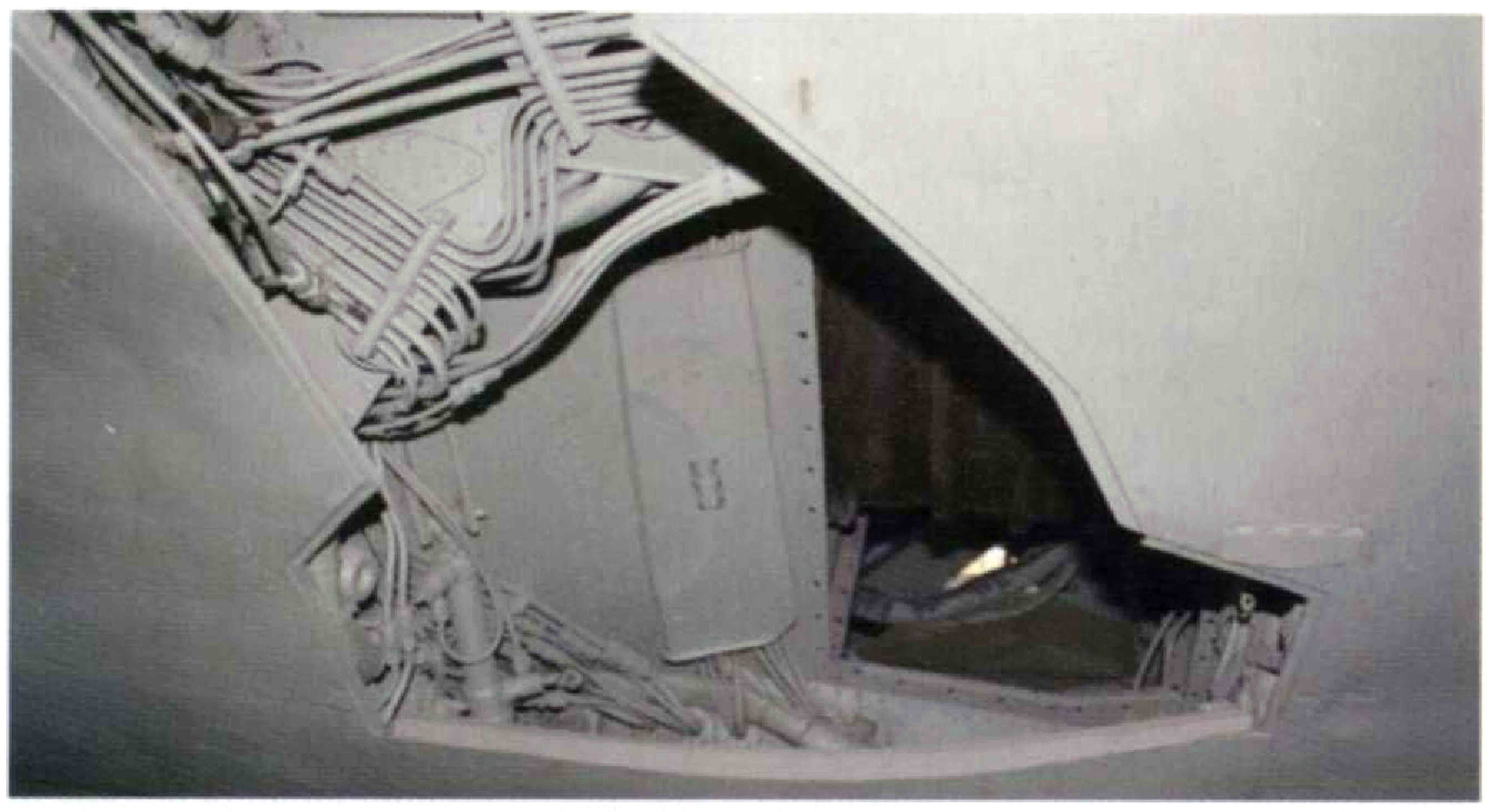


The appliqué armour on either side of the cockpit area on the A-26K has wooden beading along the bottom to reduce sharp edges and thus airflow disturbance

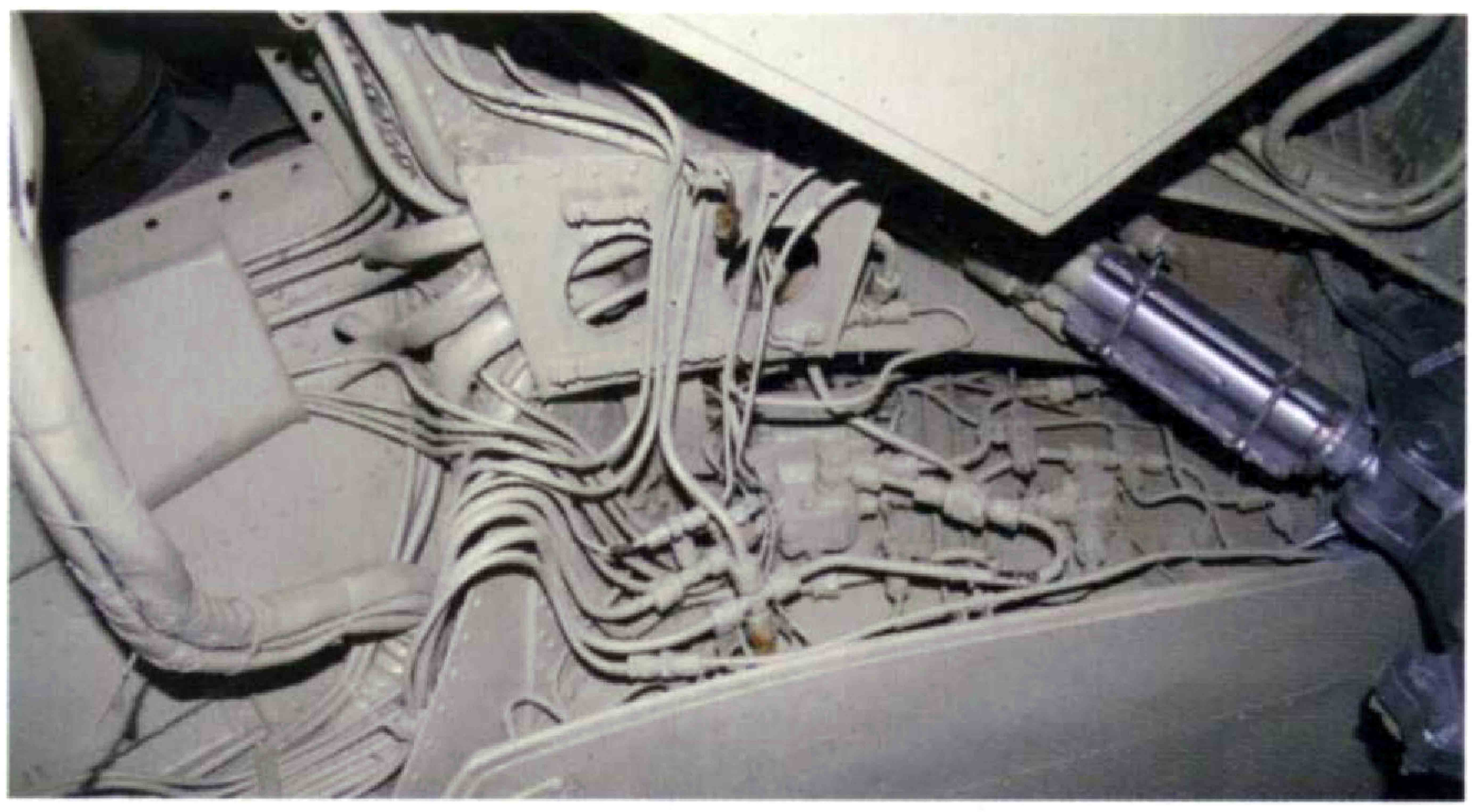
Up inside the main wheel bay, this is the port side one, looking forward

Hawker Sea Hawk by Charles Polidano

Hawker Sea Hawk FGA Mk 2, WV826, is held at the Malta Aviation Museum, which is located at the wartime RAF base of Ta' Qali. The aircraft retains its true serial but has been restored and repainted by the Museum in the colours of an FGA Mk 6 that served with No. 804 Sqn, Fleet Air Arm, during the Suez Crisis in 1956.



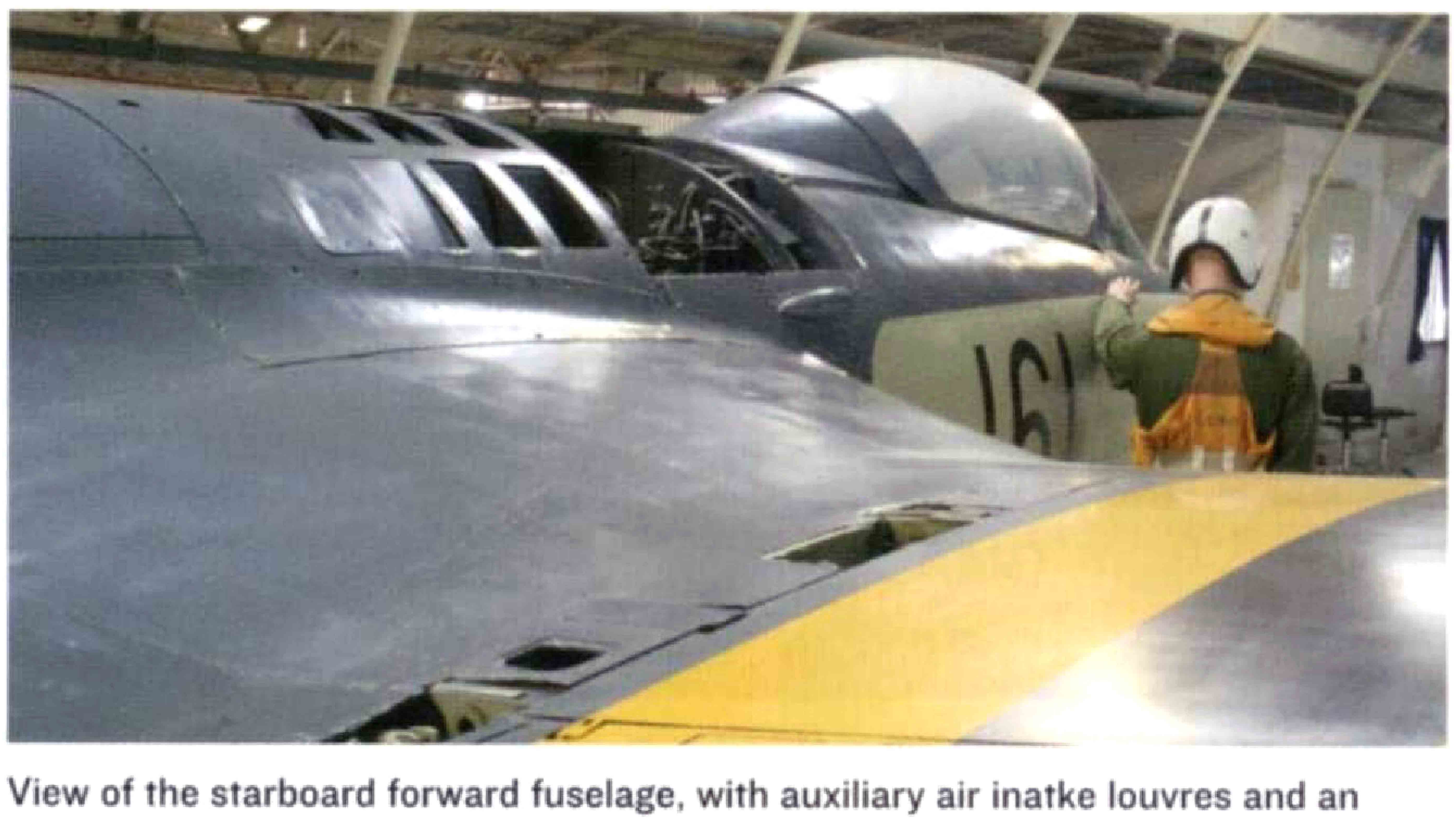
The port main undercarriage bay. Note how it is possible to see right through to the other side beneath what is probably the engine housing



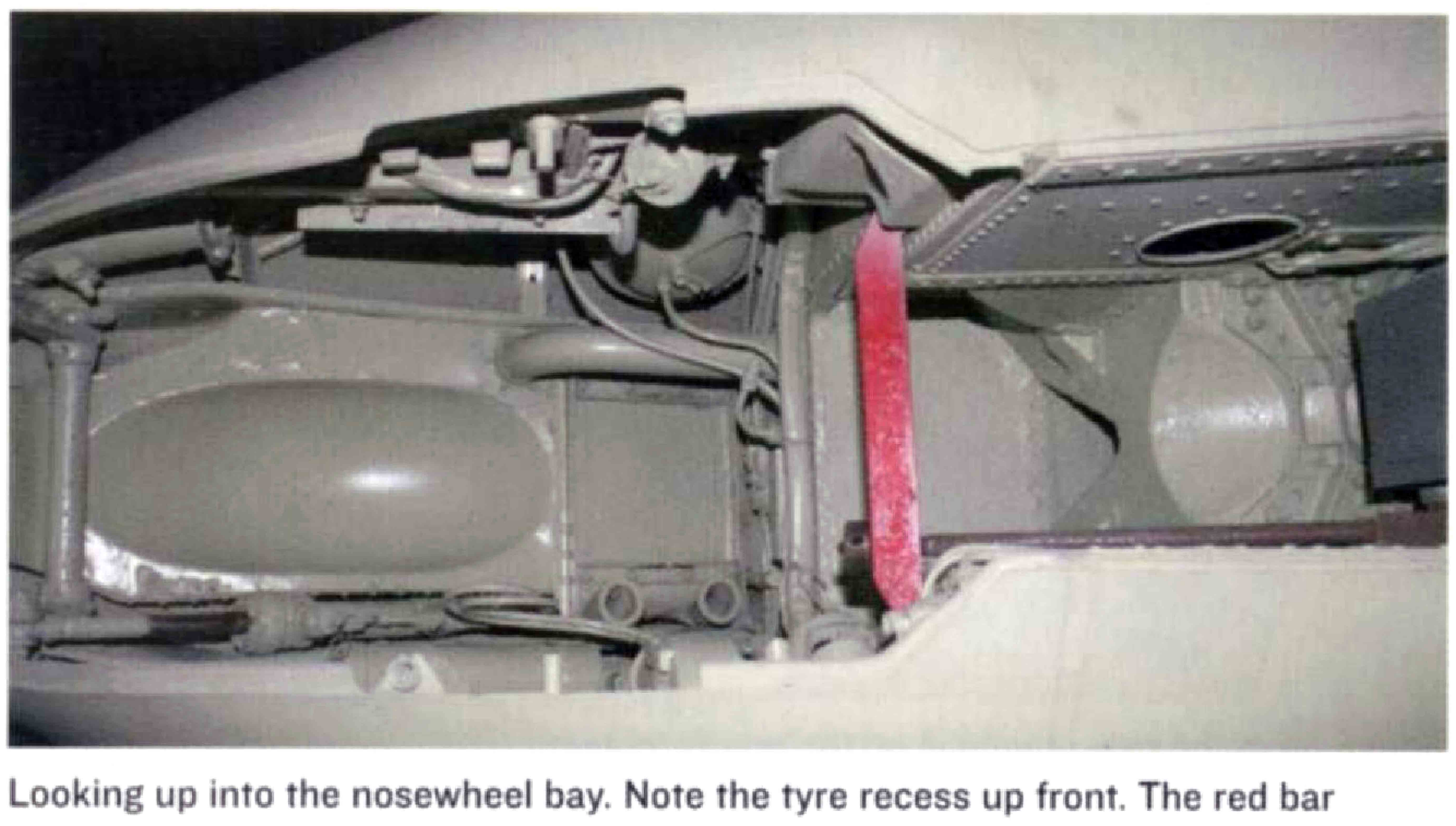
A look inside the starboard main undercarriage bay. The uniform Sky colour is presumably the result of repainting during restoration work

The port jet pipe. The engine turbine is just visible

View of the tail section with the aerodynamic bullet fairing at the joint between the fin and tailplanes



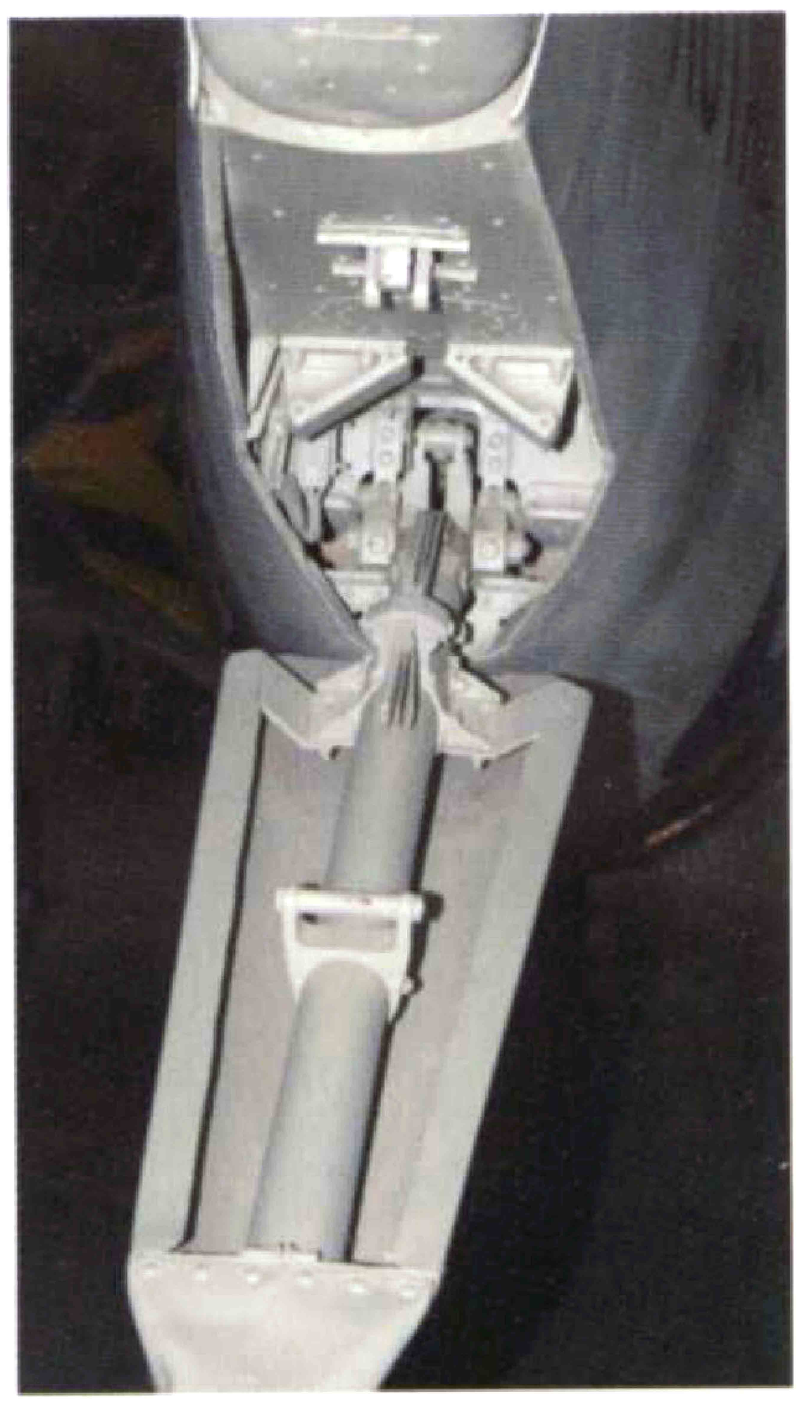
View of the starboard forward fuselage, with auxiliary air inatke louvres and an open fuselage panel. Note also the open panels above the wing fold mechanism



Looking up into the nosewheel bay. Note the tyre recess up front. The red bar appears to be a type of locking pin

The cockpit interior, instrument panel and control column

The starboard main undercarriage leg, viewed from the rear

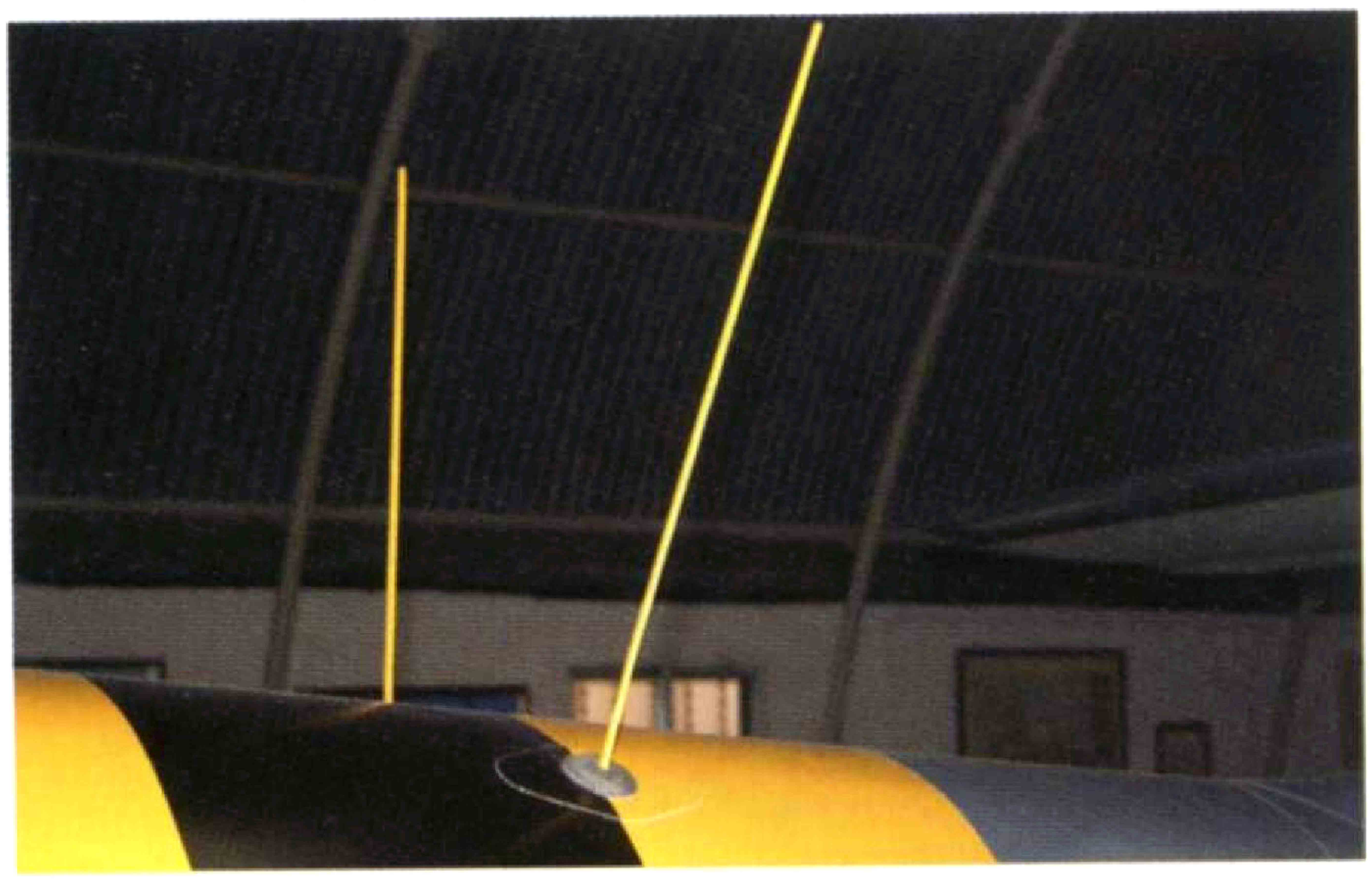


Close-up of the arrestor hook pivoting mechanism beneath the rear fuselage

Overall view of the nose wheel leg. The square tube is just to stop the scissor link collapsing, it is not original!

This is the nose wheel door, seen from behind with the linkage at the top and locks at the bottom

A look inside the open panel on the upper fuselage just behind the cockpit



Close-up of the twin antennas on the rear fuselage

The port wing folding mechanism

WRITTEN BY RICHARD J. CARUANA

HAWKER SEA HAWK

Protagonist of the Suez Campaign

Sitting on the edge of a cliff at the very end of Hal Far runway in Malta was the best vantage point from where to watch the activities of this Royal Naval Air Station (RNAS), certainly the busiest and most important in the Mediterranean during the late 1950s. An enormous cloud of black smoke, followed by the sound of Nene engines starting up and revving, was the signal that the entire squadron of Sea Hawks parked at the opposite end of the airfield was being 'launched' for another day of gun and rocket firing practice. The target, as always, was a small, uninhabited rock the size of a small village a few miles south of Hal Far. In no time at all one could see the Sea Hawks diving down in 'follow the leader' fashion, launching their rockets from a distance and then emptying their guns at close range. What a way to spend a summer day during the school holidays....

In this day and age of escalating defence costs, we are used to the longevity of aircraft types that remain in service for decades, and almost certainly new types entering service today will still be around in 25 to 30 years time. The situation was very different between 1920 and the late 1940s, mainly due to the rapid technological and aerodynamic advances of that period. Normal lifespan for a frontline fighter during those years was less than a decade, and the Hawker Sea Hawk was not expected to be an exception. That the type was still in frontline service with the Indian Navy until replaced by the Sea Harrier in the early 1980s lifts the Sea Hawk out of the ordinary and places it in a niche of its own.

Though the Fleet Air Arm (FAA) formed part of the 'Senior Service', it fought throughout most of the Second World War with outdated equipment or navalised versions of fighter aircraft produced for the Royal Air Force (RAF). Even in the latter scenario, it had to wait in line for years to acquire navalised Hurricanes and Spitfires, which were pressed into service more through sheer operational pressure than from conviction of their suitability. The first attempt at a completely original jet-powered design for naval use in the form of the Attacker – which in fact used much tooling from the Spiteful – was nothing short of a disappointment.

A DIFFICULT BEGINNING

The Sea Hawk's story actually started on 1st September 1944 when the Hawker Fury, built to specification F.2/43, took to the air for the first time. Planned at the time as an improved Tempest for use by the RAF in the Far East, it was rejected and passed on (yes, you guessed) to the FAA as the Sea Fury (see MAI Issue 10, May 2006). During the initial development stage of the prototypes, however, it was decided to try and adapt the airframe to take a jet engine. The 3,500lb Derwent was considered to be hopelessly short of power for such a massive fighter, so Hawker opted for the Rolls-Royce B.41 (a development of the Derwent) around which the Fury prototype was modified. With the engine fitted amidships so that the pilot's cockpit could be moved as far forward as possible to improve forward visibility (very important for a type that will land on a carrier), Hawker adopted split lateral air intakes similar to those of the Vampire, while the exhaust was carried straight to the tail-end of the fuselage (a very conventional layout later used on the Hunter). The design was submitted to the Air Staff as the P.1035 in November 1944.

WV826 belonging to the Malta Aviation Museum seen at its first public appearance, during the September 1999 Malta International Air Show. It had been acquired from the Phoenix Aviation Museum only a few weeks previously and the restoration team performed a small miracle to have it ready in time for the show, considering the condition in which it was when it arrived on the Island (R.J. Caruana)

FGA Mk 6 XE371/184 from No.806 Squadron is ready for start-up, with the pilot being strapped up in the cockpit. Apart from two rocket rails the aircraft is also fitted with a bomb rack (R.J. Caruana Archives)

Within a few weeks, Hawker presented an amended design in the form of the P.1040. The main difference concerned the way the engine exhaust was now directed through a bifurcated pipe (patented by Hawker) exiting on either side of the fuselage, just aft of the wing trailing edges. This system considerably shorted the exhaust pipe, simplifying design and construction of the rear fuselage. Moreover, space gained behind the engine was utilised to house a considerable volume of fuel. The wings, now devoid of any fuel tanks and related plumbing, could be designed and built to an ideally thin profile. By that time, the design team had departed considerably from the 'Fury' layout, so much so that even the elliptical wing platform was abandoned in preference to a much more conventional design, featuring straight leading and trailing edges, thus making its construction far easier. To clear the exhaust efflux, the tailplane was set higher up the fin, and a tricycle undercarriage was deemed necessary to provide the pilot with an excellent view forward whilst on the ground. A quartet of Hispano 20mm cannon was chosen as armament, laid out in pairs on either side of the cockpit tub with shell magazines positioned behind the cockpit's rear bulkhead. Although Rolls-Royce exhibited some reservations about the feasibility of the bifurcated jet pipe, Sidney Camm felt that he had sufficient data to proceed with the project, and a new prototype was submitted to Hawker's Experimental Department. As war in Europe came to a close (VE Day), followed a few months later by the end of the war in the Far East (VJ Day), official enthusiasm for new proposals, including Hawker's P.1040, waned both at the Air Ministry and the Admiralty. All services were announcing widespread cancellations of military orders and the RAF seemed satisfied that it could face the post-war period with the introduction of the Hawker Tempest and Gloster Meteor, while the FAA was still awaiting the delivery of its first Sea Furies.

NAVAL INTEREST

Well known for his tenacity, Sydney Camm could not let the P.1040 project disintegrate. He presented a navalised version to the Admiralty in January 1946, rightly foreseeing the near impossibility of a naval version of the Meteor becoming a reality. The FAA was impressed by the projected long-range capabilities of Hawker's jet fighter together with the improved performance promised by the Nene's (B.41) higher thrust, and issued an Instruction to Proceed for three prototypes. Specification N.7/46 was then issued in May covering the first P.1040 (VP401), a second test structure (VP407) and two navalised examples (VP413 and VP422). The specification called for folding wings, catapult spools and four nose-mounted 20mm Hispano cannon, but when VP401 took off for its initial flight on 2nd September 1947 powered by a Rolls-Royce Nene of 4,500lb thrust, it had none of these refinements. Three days after this maiden flight from Boscombe Down the prototype was transferred to Farnborough, and the only major snag encountered during the flight trials was excessive heating of the rear fuselage requiring the redesign of the efflux fairing, from the original square format to a pen-nib shape.

The plaque identifies the aircraft carrier as *HMS Ark Royal* and lists its name-sakes' exploits dating back to the Armada of 1588. Here FGA Mk 4 WV906 is being re-armed. Note the type of underwing rocket rails and unfinned external fuel tank (R.J. Caruana Archives)

Naval interest was only officially announced to the public when the second prototype (the first to meet fully the N.7/46 specification) took to the air on the 3rd September 1948. Apart from carrying the full nose armament it featured folding wings and catapult spools but, as yet, no arrestor hook. This was fitted some time later, as it proceeded from flight trials to dummy deck landings at Boscombe Down before being flown onto *HMS Illustrious* for real deck trials in April the following year. As a result of these tests, Hawker were requested to increase the wing span in order to improve low-speed handling during approach to landing on carrier decks. It had also been determined that the arrestor hook was too short, as only six successful landings had been achieved. VP413 returned to *HMS Illustrious* suitably modified in November and performed perfectly for the remaining trials, which included 25 landings. Meanwhile, VP422 had flown for the first time on 17th October 1949, featuring pylons for underwing fuel tanks and attachment points for Rocket-Assisted Take-Off Gear (RATOG); the latter was, however, never given the full blessing of the FAA, notwithstanding extensive testing. The improved Nene 2, providing 5,000lb of thrust, replaced the original powerplant and in 1949 VP401 was entered for the National Air Races at Elmdon. Piloted by Neville Duke, it won at a speed of 508mph. Two days later it also carried away the SBAC Trophy at an average speed of 510mph, and was awarded the Geoffrey de Havilland Memorial Trophy for the fastest lap when it clocked 563mph. VP401 was subsequently fitted with an Armstrong-Siddeley Snarler rocket in the tail (P.1072) becoming Britain's first rocket-powered aircraft.

Hawker received the first production order on 22nd November 1949 for the manufacture of 151 naval fighters, which by now carried the official name Sea Hawk. Further modifications were introduced including a pressurised cockpit, a Martin-Baker ejection seat and several design changes to improve take-off and landing, and to compensate for increase in weight as a result of these final additions.

KOREAN WAR BOOST

A few years of relative 'peace' were shattered in the early 1950s by the outbreak of a major conflict in Korea. This quickly exposed the error in the immediate post-war thinking of the British aviation industry, which had been reduced to a mere shadow of its former self. Attempts to speed up production of Sea Furies and Sea Hawks proved extremely difficult, and it was only following a change of Government in 1951 that Hawker's jet-powered projects➤

Sea Hawks of various marks (FB Mk 3s, FGA Mk 4s and FGA Mk 6s) can be seen together in this photo taken on *HMS Albion* while steaming towards Suez in the autumn of 1956. The representation of the badge on the nose also varies, some being flanked by a red/white-chequered board. The sailors are not engaged in common naval deck-scrubbing but are actually painting the yellow deck centreline (R.J. Caruana Archives)

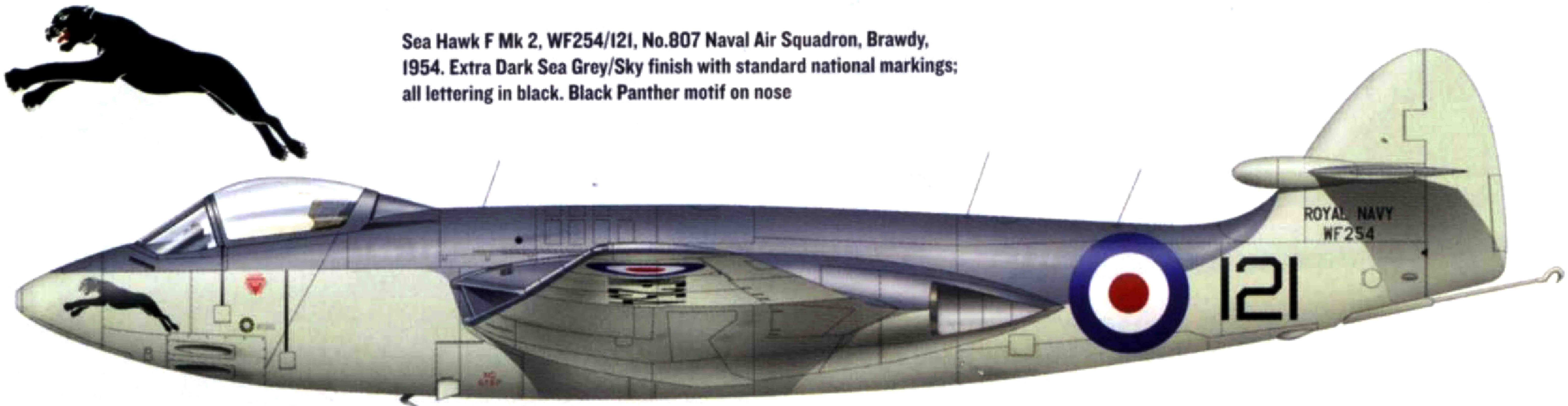
The same aircraft as seen on board *HMS Eagle* is here seen in an all-black finish during its service days at Hal Far with the Fleet Requirements Unit, which was operated by Airwork Services Ltd. (R.J. Caruana)

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2006

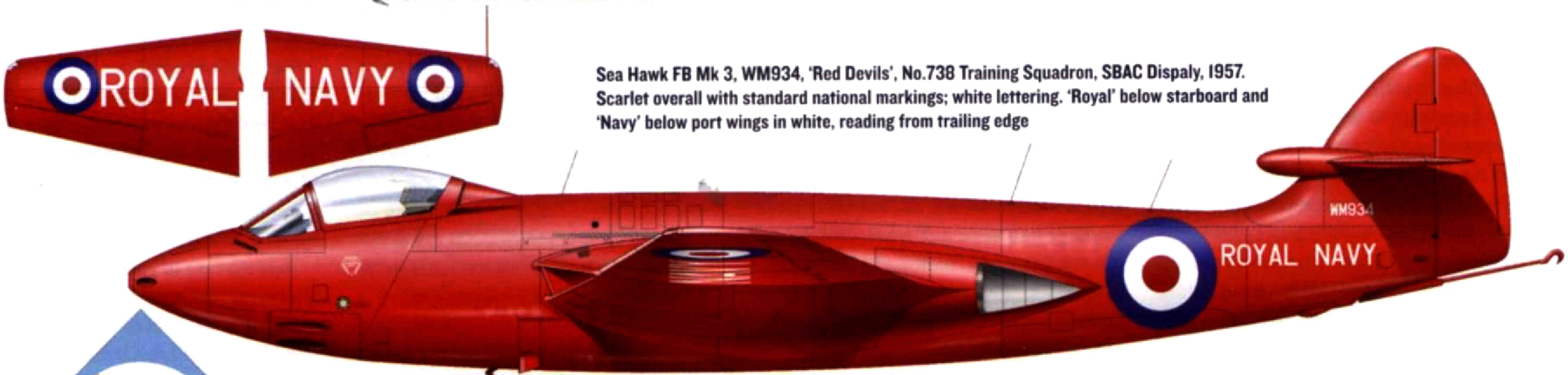
Sea Hawk F Mk I, WF156/170, No.898 Naval Air Squadron, 1953. Extra Dark Sea Grey/Sky finish with standard national markings (roundels in six positions; all lettering in black. Unit marking on forward fuselage. Standard representation of serial below wings reads from the front under the port wing, and from behind under the starboard

Sea Hawk F Mk I, WF176/180/ST, No.767 Naval Air Squadron, RNAS Stretton, 1954. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Unit crest on nose

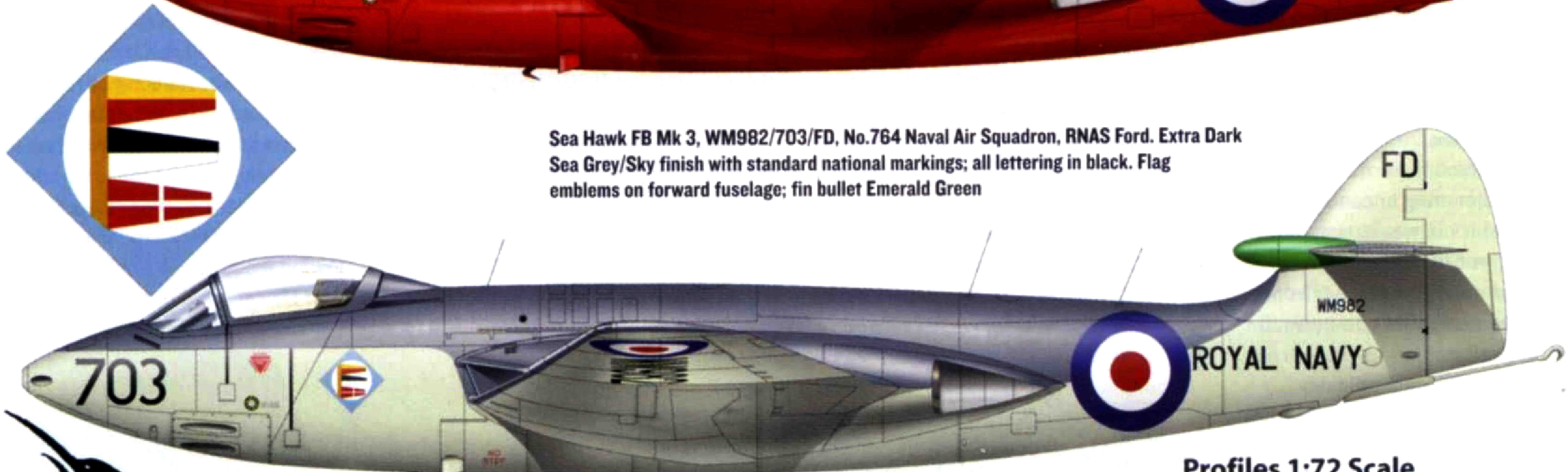
Sea Hawk F Mk 2, WF254/121, No.807 Naval Air Squadron, Brawdy, 1954. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Black Panther motif on nose



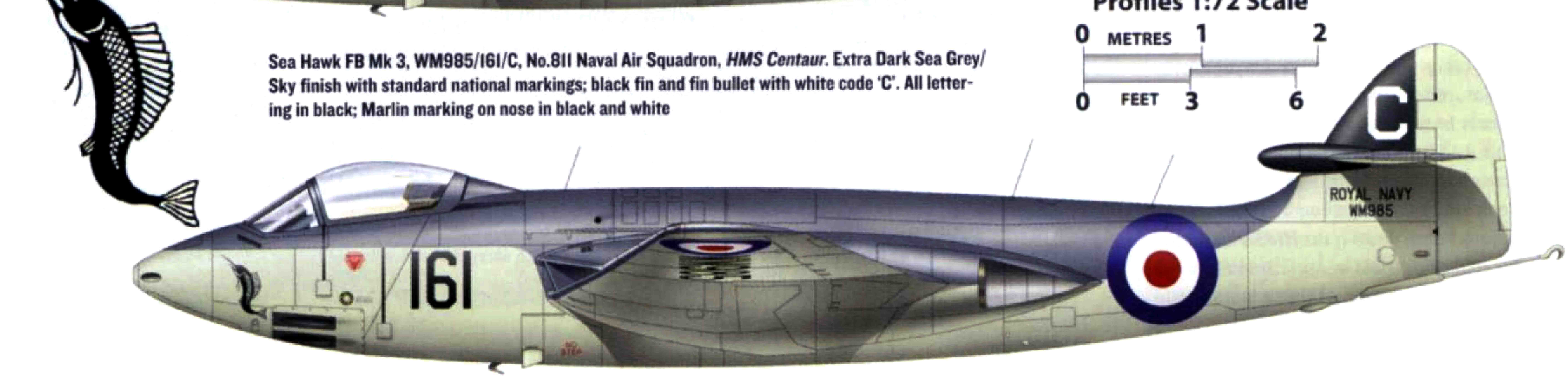
Sea Hawk FB Mk 3, WM934, 'Red Devils', No.738 Training Squadron, SBAC Dispaly, 1957. Scarlet overall with standard national markings; white lettering. 'Royal' below starboard and 'Navy' below port wings in white, reading from trailing edge



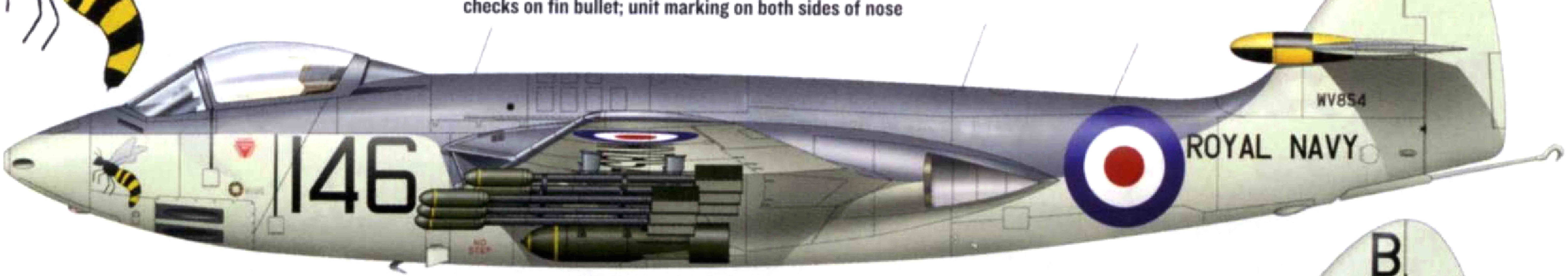
Sea Hawk FB Mk 3, WM982/703/FD, No.764 Naval Air Squadron, RNAS Ford. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Flag emblems on forward fuselage; fin bullet Emerald Green

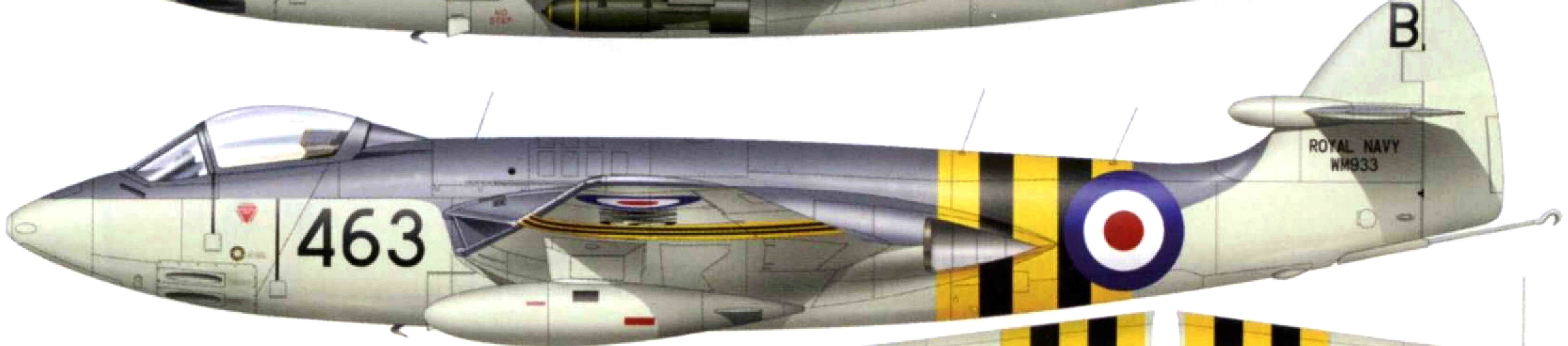


Sea Hawk FB Mk 3, WM985/161/C, No.811 Naval Air Squadron, *HMS Centaur*. Extra Dark Sea Grey/Sky finish with standard national markings; black fin and fin bullet with white code 'C'. All lettering in black; Marlin marking on nose in black and white

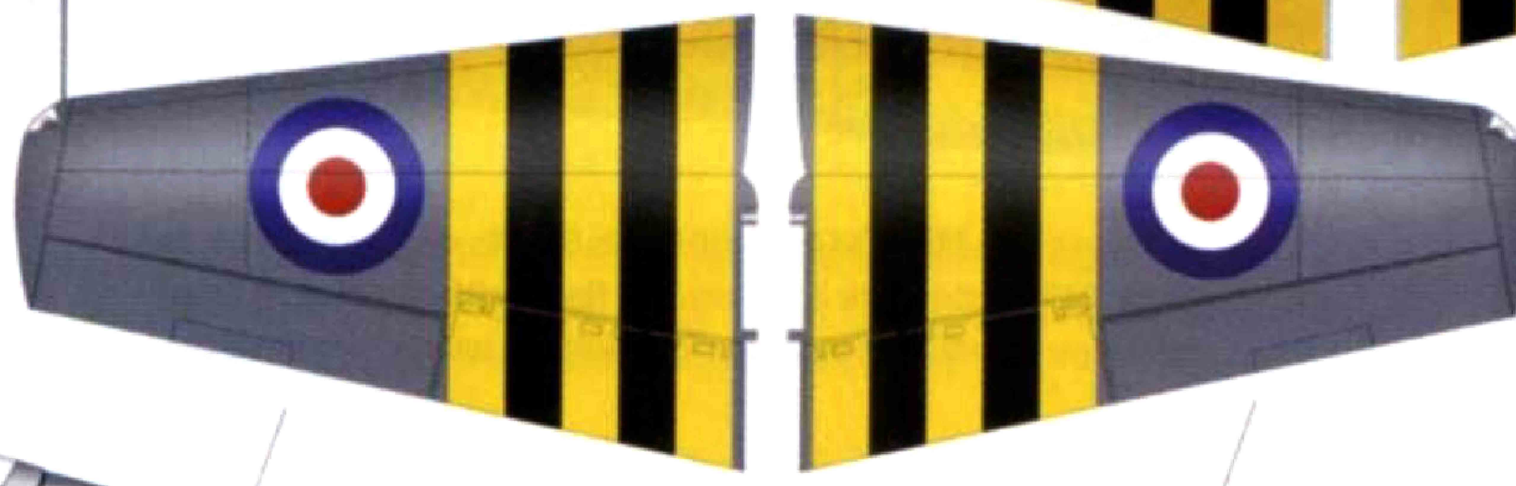


Sea Hawk FGA Mk 4, WV854/146, No.803 Naval Air Squadron. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Yellow/black checks on fin bullet; unit marking on both sides of nose

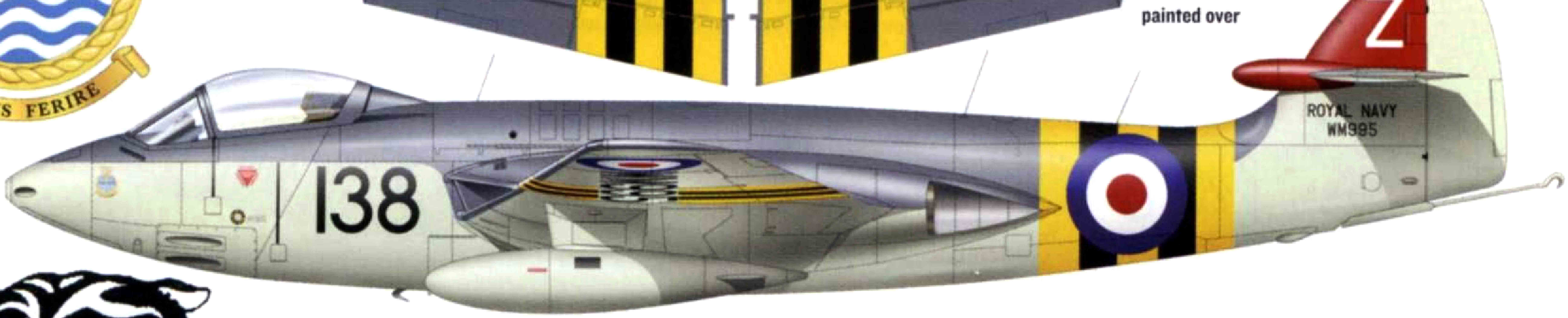




Sea Hawk FB Mk 3, WM933/463/B, No.895 Naval Air Squadron, *HMS Bulwark*, Suez, 1956. Standard finish and national markings; yellow black stripes around wings and rear fuselage (note thinner black stripes on fuselage than yellow). All lettering in black. This unit's Sea Hawks had been passed over from No.897 NAS, retaining the latter's codes

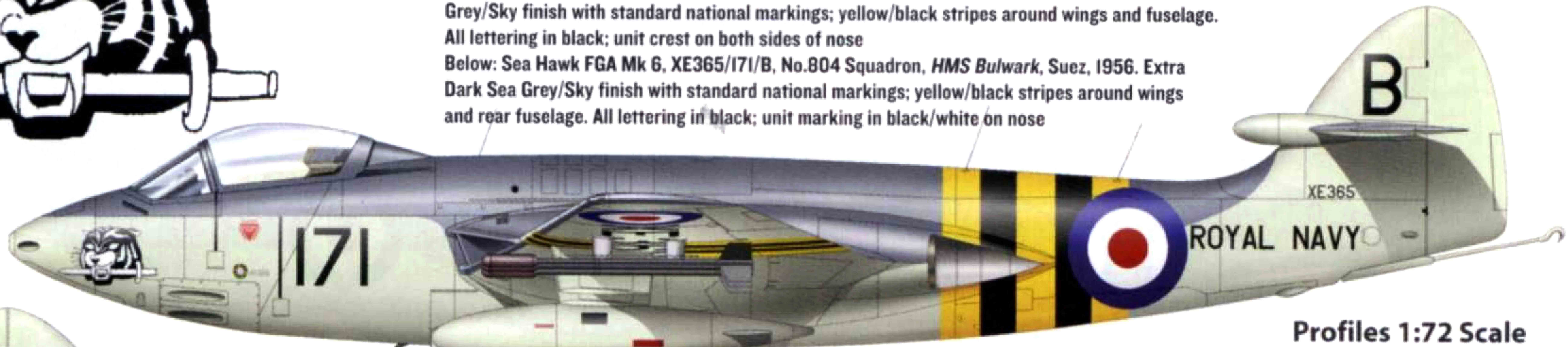


Position of yellow/black identification stripes used during the Suez Campaign. Note how underwing serials were sometimes painted over



Above: Sea Hawk FB Mk 3, WM995/138/Z, No.820 NAS, *HMS Albion*, Suez, 1956. Extra Dark Sea Grey/Sky finish with standard national markings; yellow/black stripes around wings and fuselage. All lettering in black; unit crest on both sides of nose

Below: Sea Hawk FGA Mk 6, XE365/171/B, No.804 Squadron, *HMS Bulwark*, Suez, 1956. Extra Dark Sea Grey/Sky finish with standard national markings; yellow/black stripes around wings and rear fuselage. All lettering in black; unit marking in black/white on nose



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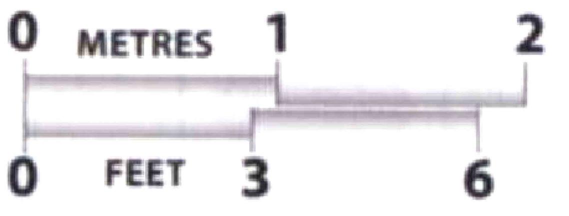
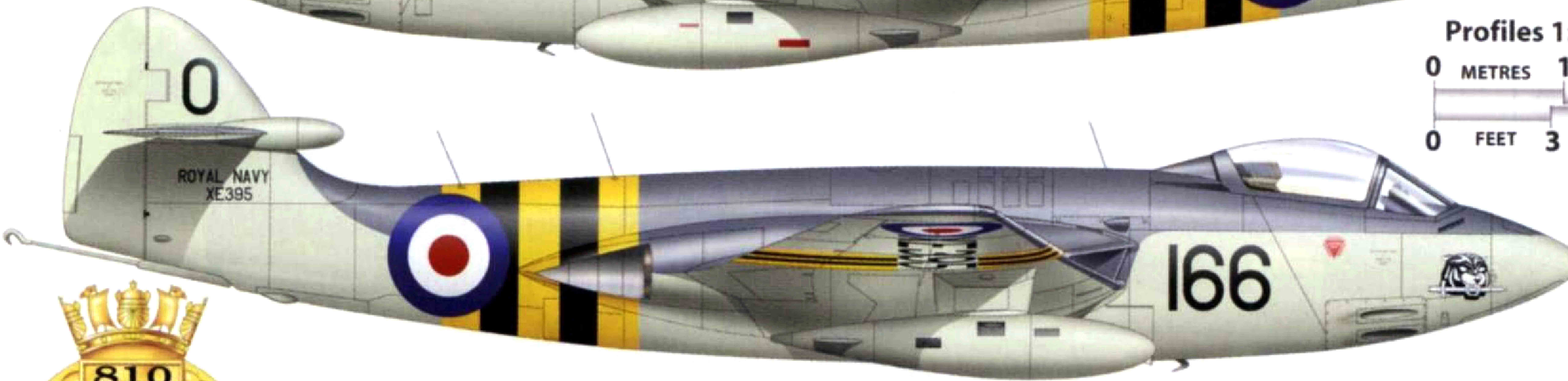
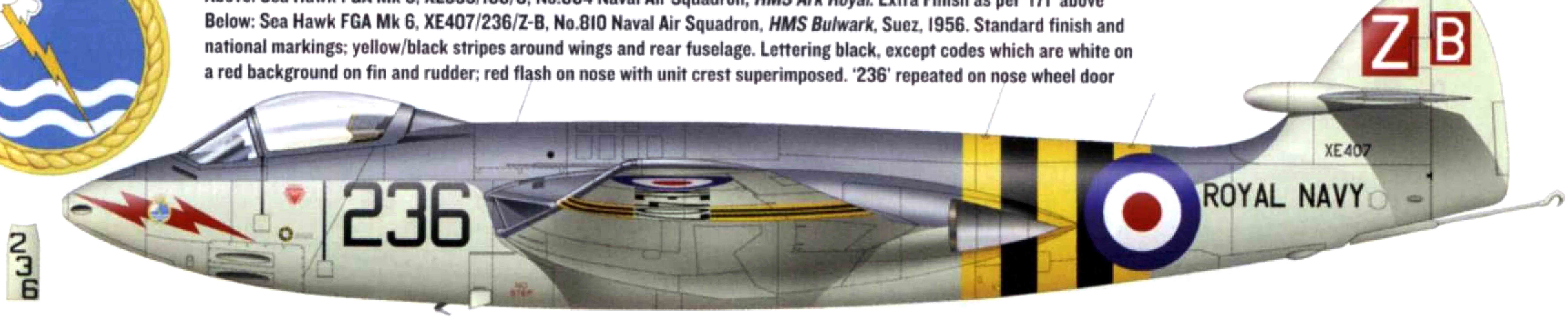




Above: Sea Hawk FGA Mk 6, XE395/166/O, No.804 Naval Air Squadron, *HMS Ark Royal*. Extra Finish as per '171' above

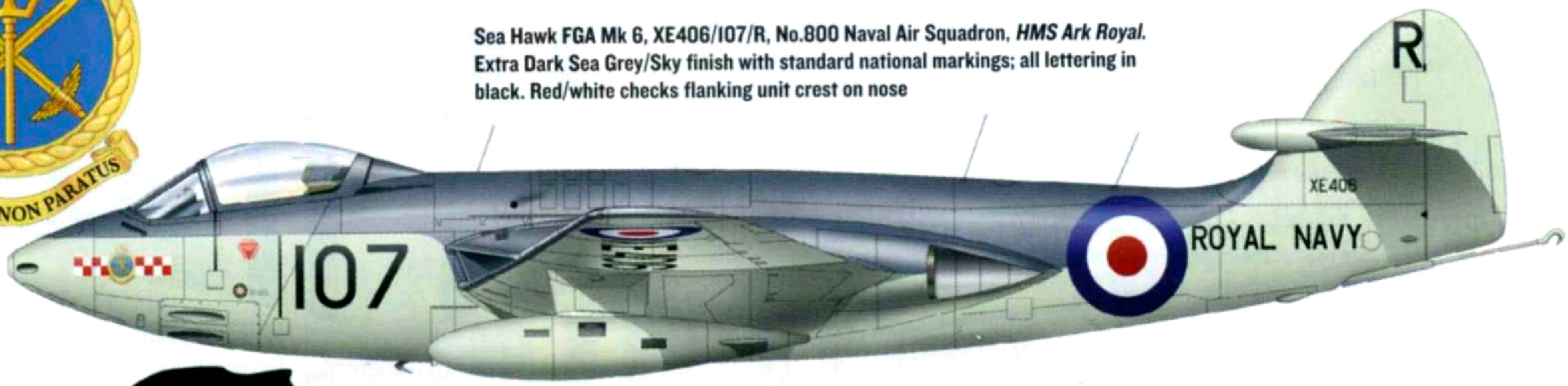
Below: Sea Hawk FGA Mk 6, XE407/236/Z-B, No.810 Naval Air Squadron, *HMS Bulwark*, Suez, 1956. Standard finish and national markings; yellow/black stripes around wings and rear fuselage. Lettering black, except codes which are white on a red background on fin and rudder; red flash on nose with unit crest superimposed. '236' repeated on nose wheel door

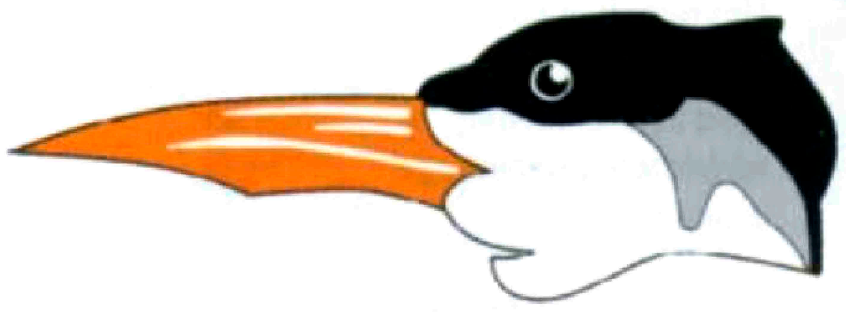


Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2006

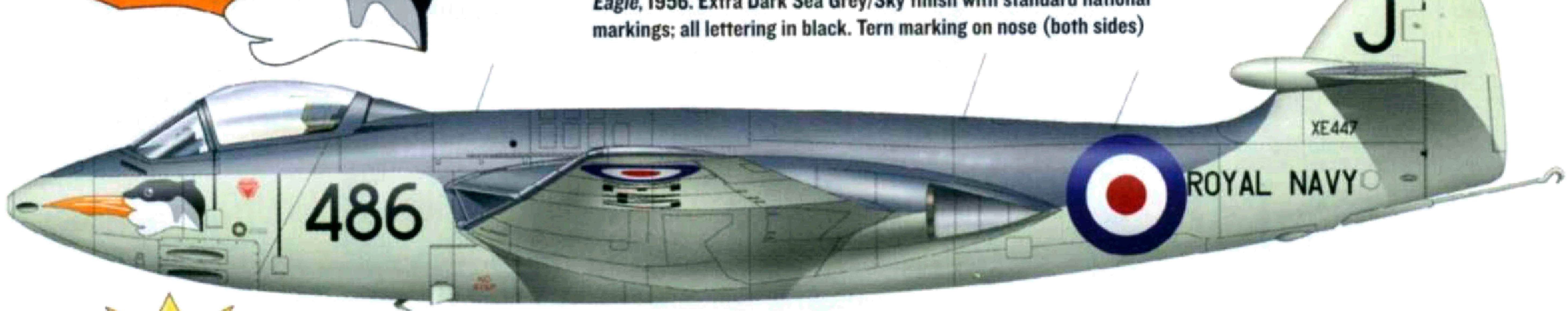
Sea Hawk FGA Mk 4, WV913/636/LM, No.738 Naval Air Squadron, RNAS Lossiemouth, 1958. Extra Dark Sea Grey/Sky finish with standard national markings; dark blue fin and fin bullet fairing. Lettering in black, except 'LM' on fin which is in white and '636' on nose which is in Extra Dark Sea Grey; winged horse emblem is black on starboard side and red on port. Note unpainted (or white) panels below front fuselage

Sea Hawk FGA Mk 6, XE406/107/R, No.800 Naval Air Squadron, *HMS Ark Royal*. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Red/white checks flanking unit crest on nose

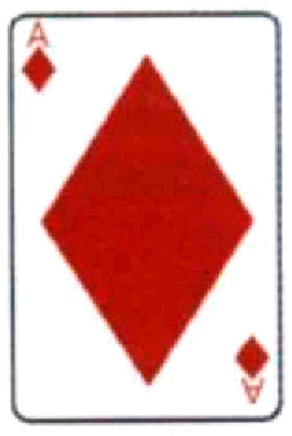




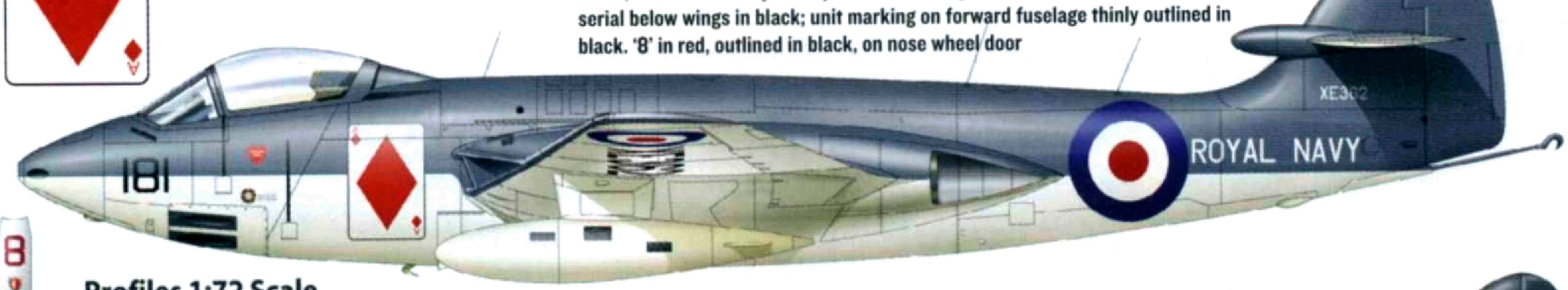
Sea Hawk FGA Mk 6, XE447/486/J, No.897 Naval Air Squadron, *HMS Eagle*, 1956. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Tern marking on nose (both sides)



Sea Hawk FGA Mk 6, XE445/128/C, No.801 Naval Air Squadron, *HMS Centaur*. Extra Dark Sea Grey/White finish with standard national markings; all lettering in black, with '128' on nose and 'C' on fin outlined in white. Unit marking in gold carried on both sides of nose



Sea Hawk FGA Mk 6, XE362/181/A, No.806 Naval Air Squadron, *HMS Albion*, early 1960. Extra Dark Sea Grey/White finish with standard national markings; serial, code 'A' and 'Royal Navy' on rear fuselage in white. Code '181' on nose and serial below wings in black; unit marking on forward fuselage thinly outlined in black. '8' in red, outlined in black, on nose wheel door



Profiles 1:72 Scale

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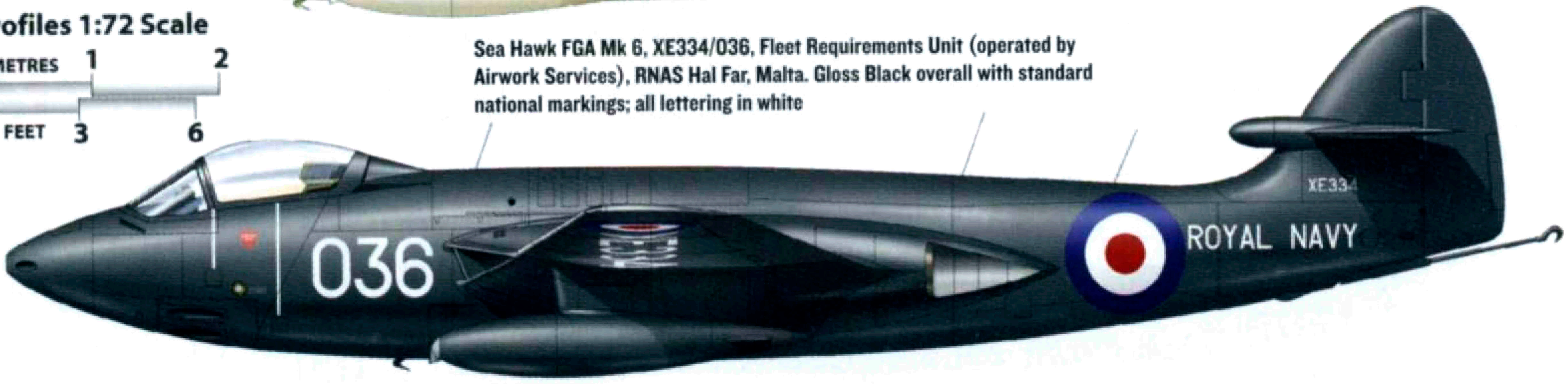
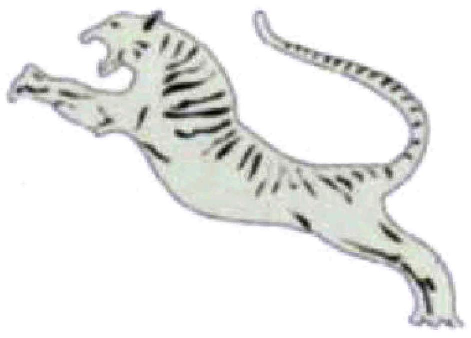
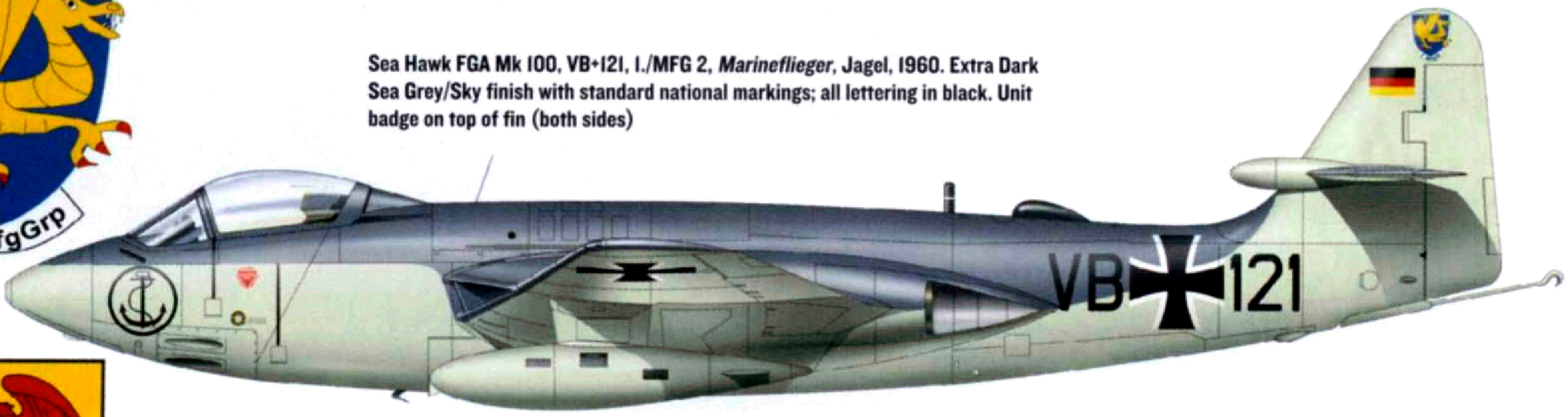
Sea Hawk FGA Mk 6, XE334/036, Fleet Requirements Unit (operated by Airwork Services), RNAS Hal Far, Malta. Gloss Black overall with standard national markings; all lettering in white



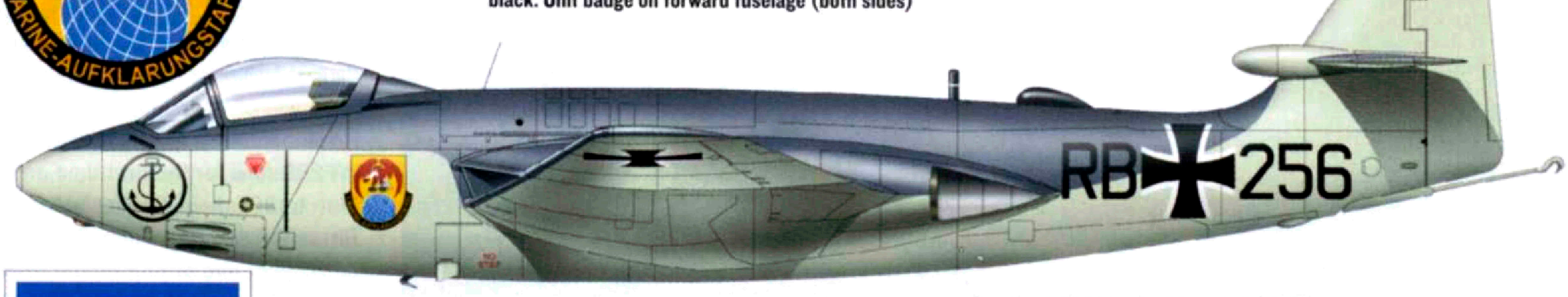


Sea Hawk FGA Mk 6, IN166/080/W, No.300 (White Tigers) Squadron, *INS Vikrant*. Extra Dark Sea Grey/White finish with standard national markings (orange/white/green roundels); all lettering in black. Unit marking on nose

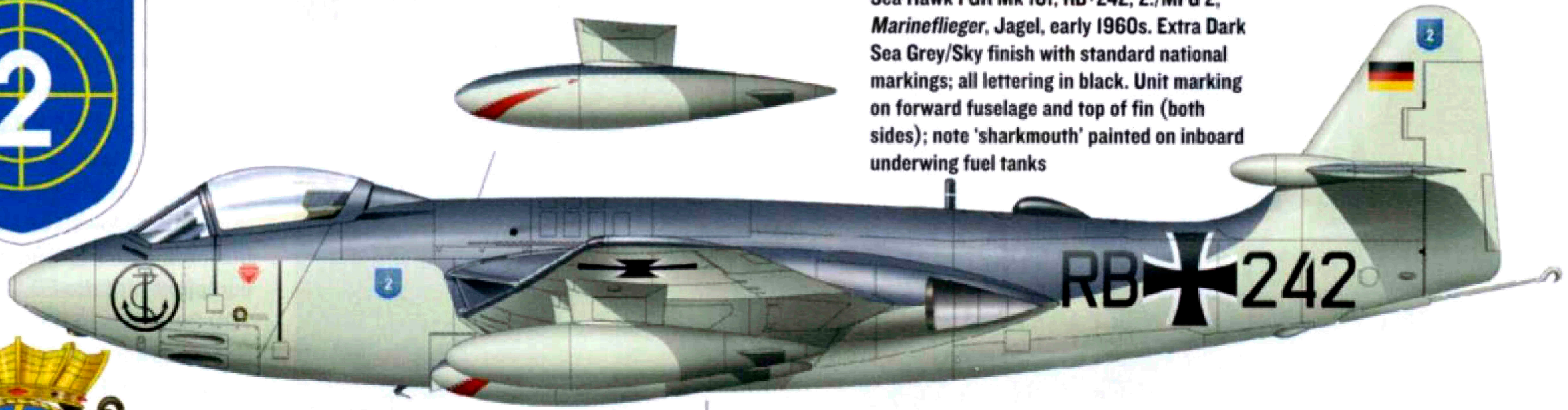
Sea Hawk FGA Mk 100, VB+121, 1./MFG 2, *Marineflieger*, Jagel, 1960. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Unit badge on top of fin (both sides)



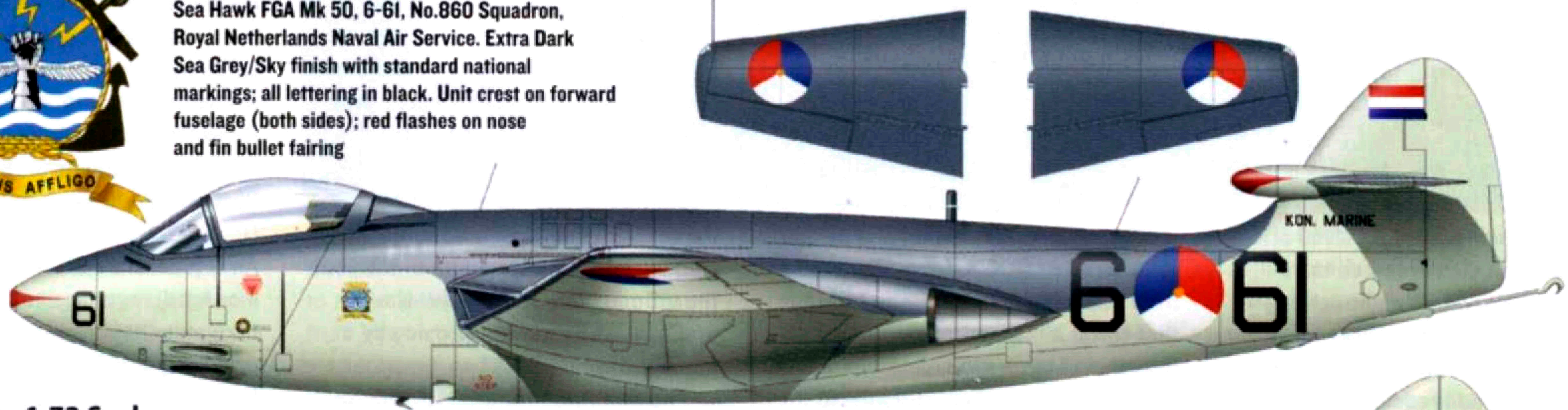
Sea Hawk FGR Mk 101, RB+256, 2./MFG 1, *Marineflieger*, Husum, October 1959. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Unit badge on forward fuselage (both sides)



Sea Hawk FGR Mk 101, RB+242, 2./MFG 2, *Marineflieger*, Jagel, early 1960s. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Unit marking on forward fuselage and top of fin (both sides); note 'sharkmouth' painted on inboard underwing fuel tanks



Sea Hawk FGA Mk 50, 6-61, No.860 Squadron, Royal Netherlands Naval Air Service. Extra Dark Sea Grey/Sky finish with standard national markings; all lettering in black. Unit crest on forward fuselage (both sides); red flashes on nose and fin bullet fairing



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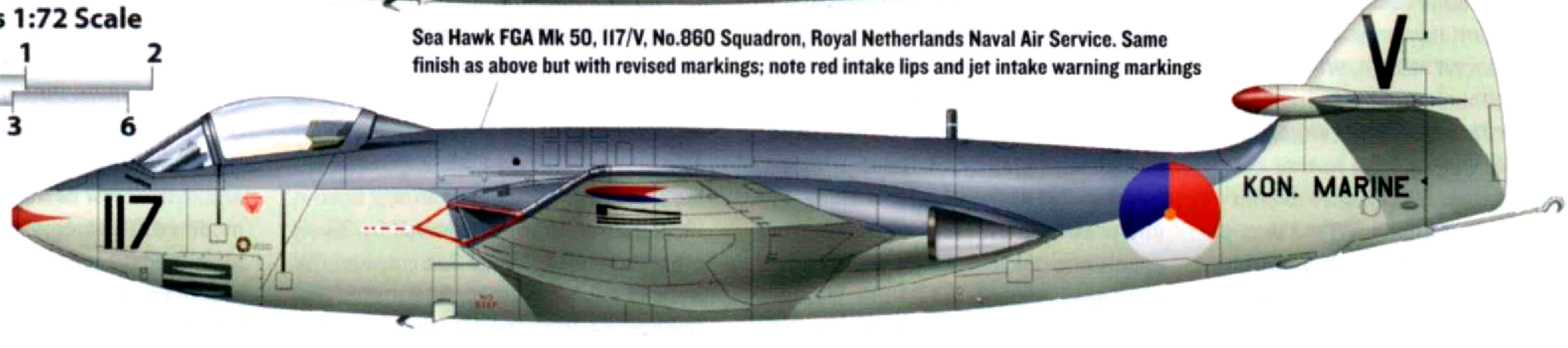
Sea Hawk FGA Mk 50, 117/V, No.860 Squadron, Royal Netherlands Naval Air Service. Same finish as above but with revised markings; note red intake lips and jet intake warning markings



What an infernal noise! A formidable line up of Sea Hawks start up their Nenes filling the air with smoke at *HMS Falcon* – RNAS Hal Far at Malta. A Short Sturgeon can be seen taking off in the background while the aircraft parked at far left is a Wyvern (R.J. Caruana Archives)

Another scene on board *HMS Eagle* as FGA Mk 6, XE344/476/E of No.898 Squadron is marshalled on the flight deck. This aircraft is fitted with a finned fuel tank and you can also see the catapult track in the foreground (R.J. Caruana Archives)

FB Mk 3 WF287/140 is one of four Sea Hawks seen in this picture, which have started up their engines on board the flight deck of *HMS Eagle*. The date must be after 1956 as the previous fin code 'J' has been exchanged for 'E'. Note also the Whirlwind helicopter and Fairey Gannet (R.J. Caruana Archives)

(Sea Hawk and Hunter) received priority. Production, however, had to be transferred elsewhere as Armstrong-Whitworth (part of the Hawker-Siddeley group) at Coventry took over after Hawker had produced only 35 Sea Hawks at their Kingston plant. These initial F Mk Is (WF143-161, WF167-177 & WM901-905) built under Contract SP6/AC/3142/CB.7b were mainly engaged in service trials ranging from further carrier trials (aboard *HMS Eagle*) to cold weather tests in Canada. WF147 was to become the F Mk 2 prototype with powered ailerons, while WF157 was retained and modified to become the FB Mk 3 equipped with underwing pylons for a total of 1,000lb. Other Sea Hawks from this initial batch went to form the first Naval Air Squadron (No. 806) at Brawdy in March 1953, participating in the Coronation Review at Spithead the following June. In February 1954 the unit embarked on *HMS Eagle* carrying the famous 'Ace of Diamonds' markings. Nos.804 and 898 Squadron were also formed with the F Mk I. Some criticism was levelled at the FAA for rushing into procuring the Sea Hawk after the appearance of Hawker's sweptback-wing development, the P.1052. It was rightly argued, however, that waiting for the realisation of a fully operational version of the P.1052 would have delayed the introduction of the Royal Navy's first true jet fighter into service by a number of years.

The first Armstrong-Whitworth Sea Hawk F Mk I (WF162) made its first flight on 18th December 1952 with the 60th and last of its kind flying by December of the following year. The first production F Mk 2 (WF240) took to the air on 24th February 1954 from Bitteswell, followed by 39 other examples. These Sea Hawks went to equip Nos.802, 806 and 807 Squadrons. With the FB Mk 3, the Sea Hawk became a true fighter-bomber. WF280 flew for the first time on 13th March 1954, being extensively tested at Bitteswell and Boscombe Down for the carriage of two or four 500lb bombs, twenty 3-inch rockets with 60lb warheads, and 88-gallon drop tanks, mines and napalm in different combinations. With a total production of 116 examples, the Sea Hawk FB Mk 3 became the widest used version. FAA squadrons equipped with it began with No.806 in July 1954 followed by Nos.800, 801, 803, 811, 897 and 898. Shore stations equipped with the FB Mk 3 included No. 700 Squadron at RNAS Ford and the Naval Fighter School at Lossiemouth.

The FGA Mk 4 lost much of its punch, as the added weight of armament was not proportionally compensated by an increase in engine power. Notwithstanding its poor performance, 97 examples were built starting with WV792, which flew for the first time on 26th August 1954. The type served with Nos.803, 804, 810, 897 and 898 Naval Air Squadrons. Thankfully, Rolls-Royce managed, regardless of considerable budget limitations, to upgrade the Nene providing an additional 200lb of thrust. Hoping for the best, the Admiralty ordered all FB Mk 3s and FGA Mk 4s to be re-engined with this improved version. Thus modified, the FB Mk 3 became the FB Mk 5 and the FGA Mk 4 the FGA Mk 6, but only 50 of the former and even fewer of the latter were thus modified. The increase in thrust did not alter the high-end spectrum of the aircraft's performance, but it did give the Sea Hawk a bit more power at the lower end, especially on take-off and landing – a saving grace, which improved low level handling considerably. 86 new-build Sea Hawk FGA Mk 6s were ordered and delivery of this batch was completed by January of 1956. By June of that year these had joined Nos.800, 802, 804, 897, 898, and 899 Naval Air Squadrons.

"With the Hunters at Cyprus unable to cope due to inadequate range the brunt of ground-attack operations were pressed home by the Sea Hawk"

TROUBLE AT SUEZ

It was during 'Operation Musketeer', the Anglo-French landings of the Suez Crisis in November 1956, that the Sea Hawk's capabilities became fully appreciated. During this short but hectic period of operations Nos.800, 802, 804, 810, 895, 897 and 899 Squadrons of the FAA were embarked on three aircraft carriers – *HMS Bulwark, Eagle* and *Albion* – and the Navy's frontline fighter gave a very good account of itself. The RAF's Hunter F Mk 5s at Cyprus were unable to cope with the situation due to their inadequate range, and the brunt of the ground-attack operation was pressed home by Sea Hawks, in many instances facing heavy return fire. The three carriers sailed from Malta on 26th October 1956, taking up station some 50 miles from the Egyptian coast by the end of that month. During that journey, Sea Hawks (and most other aircraft) acquired recognition stripes reminiscent of D-Day. There seems to have been some confusion regarding the specified colours, as British forces were required to apply white and black stripes while yellow and black stripes were reserved for the French. It is still a mystery how eventually most (if not all) RAF and FAA aircraft participating in this campaign adopted the yellow and black bands?

Following the Suez crisis the FAA's use of the Sea Hawk began to wane as the Sea Vixen and Scimitar were waiting on the sideline, thus offering a great step forward in technology for the Navy. These aircraft had twin engines of the much safer axial-flow type, had 30mm Aden cannon, could carry guided missiles and even had nuclear strike capability. However, Hawker's small and elegant fighter did manage one last star appearance when five all-scarlet Sea Hawks of No.738 Naval Training Squadron performed aerobatics at the 1957 SBAC Display. By the following year the type began to be relegated to second-line units, with No.806 Squadron relinquishing their last Sea Hawks on 15th December 1960.

EXPORT SEA HAWKS

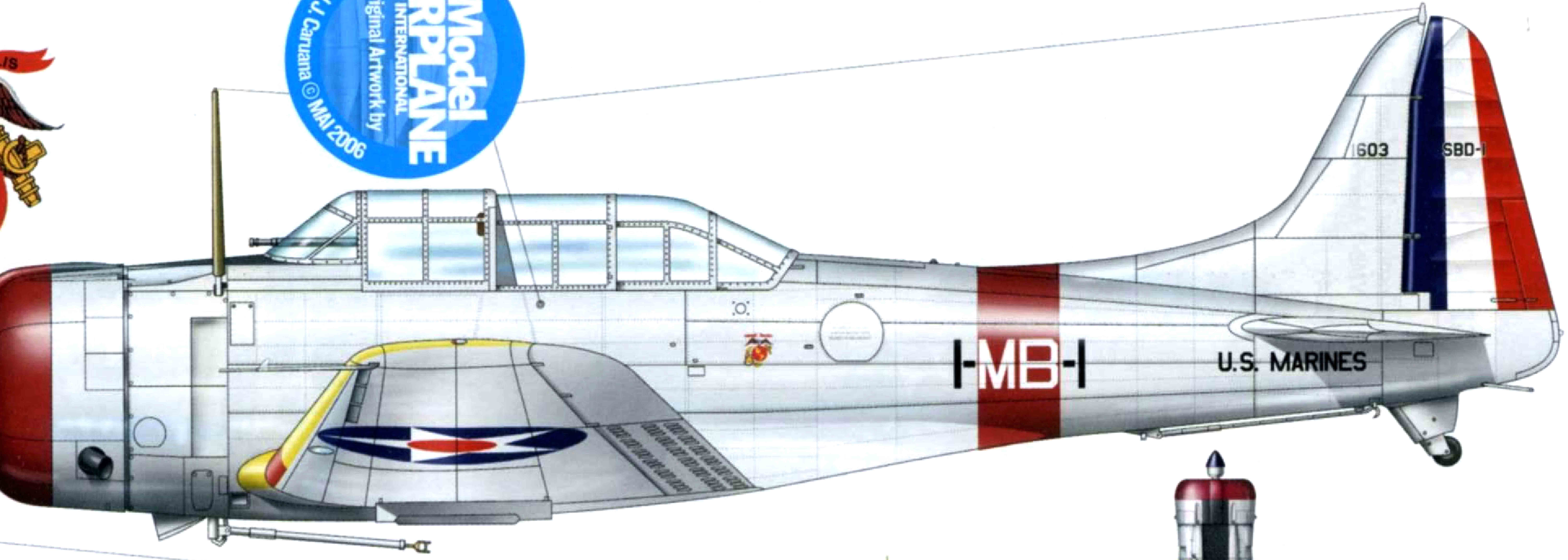
Throughout its service career the Sea Hawk fulfilled all that had been asked of it and was considered as one of the most popular aircraft to see service. Its ease of maintenance on deck or ashore, coupled with a quick turn-around, made it an ideal shipboard type, and once in the air it was very easy to fly. An export drive aimed at Australia and Canada to equip with Sea Hawks did not bear fruit. Maybe in an attempt to push the matter home, ex-FAA Sea Hawks were presented to navies of both countries but the number was so small that they never attained squadron service, even though some Australian Navy Sea Hawks were evaluated on board HMAS Sydney. Efforts to lure the French Navy proved just as futile. With the Sea Hawk production line at Armstrong-Whitworth nearing closure, both the Royal Netherlands Naval Air Service and the West German Marineflieger decided that the Sea Hawk could fill their naval requirements at a very reasonable price. Although the Coventry plant was in the process of being dismantled, it was reopened to accommodate these orders: 30 for the Netherlands and 64 for Germany. Sea Hawks of the NATO-funded Netherlands order were externally identical to the standard FGA Mk 6s except that they were equipped with Philips UHF radio, whose only external identification feature was a dorsal blade aerial. During 1958 these aircraft were modified to carry Philco Sidewinder IA air-to-air heat-seeking missiles using the inboard wing pylon (replacing the 500lb bomb). Designated FB Mk 50s, these aircraft were eventually retired from service towards the end of 1964. The German order involved greater changes. The FGA Mk 100 (VB+120 to VB+136) was conceived as a fair-weather day fighter-bomber, while the FGR Mk 101 (RB+240 to RB+256, RB+360 to RB+376) was a day fighter with bad weather capability. For this role the latter version was equipped with an Ecko search radar housed in a pod under the starboard wing inner pylon, the external fuel tank being moved to the second pylon usually reserved for bombs or rockets. Both Mk 100 and 101s were modified to use UHF radio and externally were easily recognised from any other Sea Hawks by their taller vertical tails. With these deliveries the Coventry Sea Hawk plant closed in 1959, but not for long!

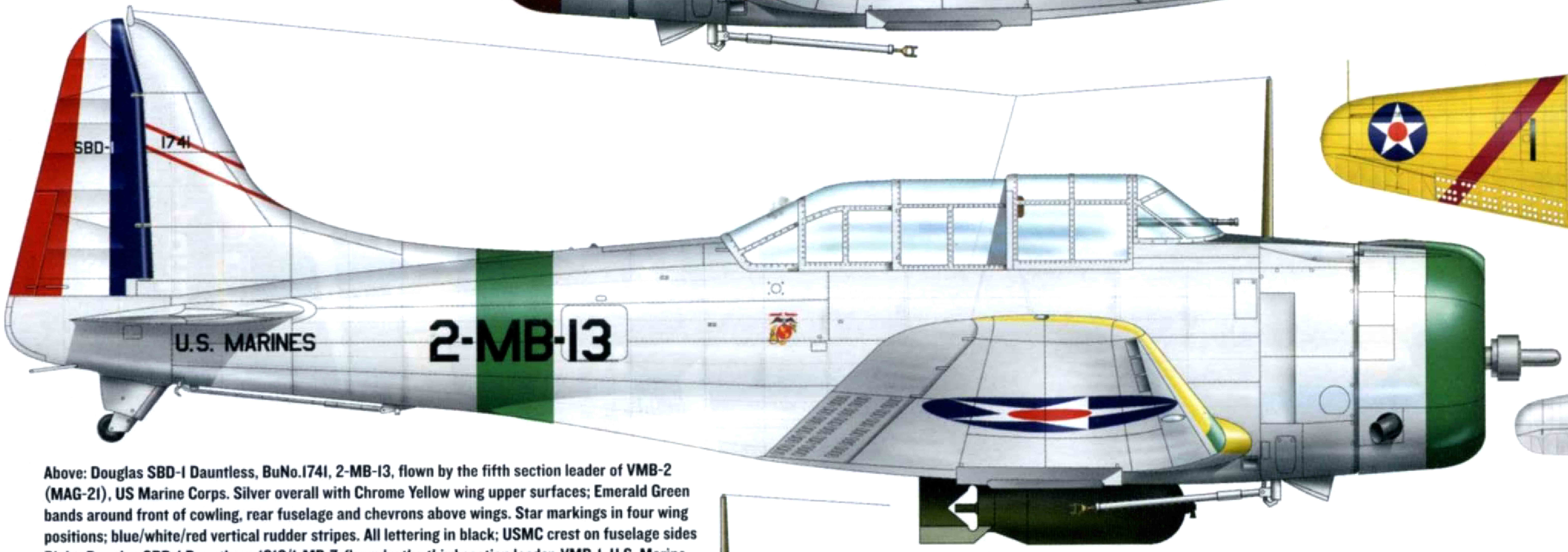
Towards the end of 1959 India purchased nine Sea Hawk FB Mk 3s from ex-FAA stocks. These were refurbished and converted to FGA Mk 6 standard (IN151-159) and were delivered during the first half of 1960. The Sea Hawk was so popular that a further order for 14 was placed. Armstrong-Whitworth had to reopen their plant for these new-build FGA Mk 6s (IN160-173), with delivery being completed in 1961. The India Navy found in the Sea Hawk an ideal fighter for use from its carrier and decided to procure more examples. It appears that more FGA Mk 6s (IN174-195) were bought at some stage, but their fate is still unclear. To ensure longevity for its Sea Hawk squadrons, India obtained ten Mk 100 and 18 Mk 101s from West Germany in 1966, and some of these saw action during the Indo-Pakistani hostilities in the Bay of Bengal during 1971. By 1980 No.300 'White Tiger' Squadron on INS Vikrant and No. 551 Squadron (which was shore-based) were reduced to no more than two-dozen aircraft. The Sea Hawk continued to fly in India for some years even after the delivery of the Sea Harrier that was supposed to replace it.

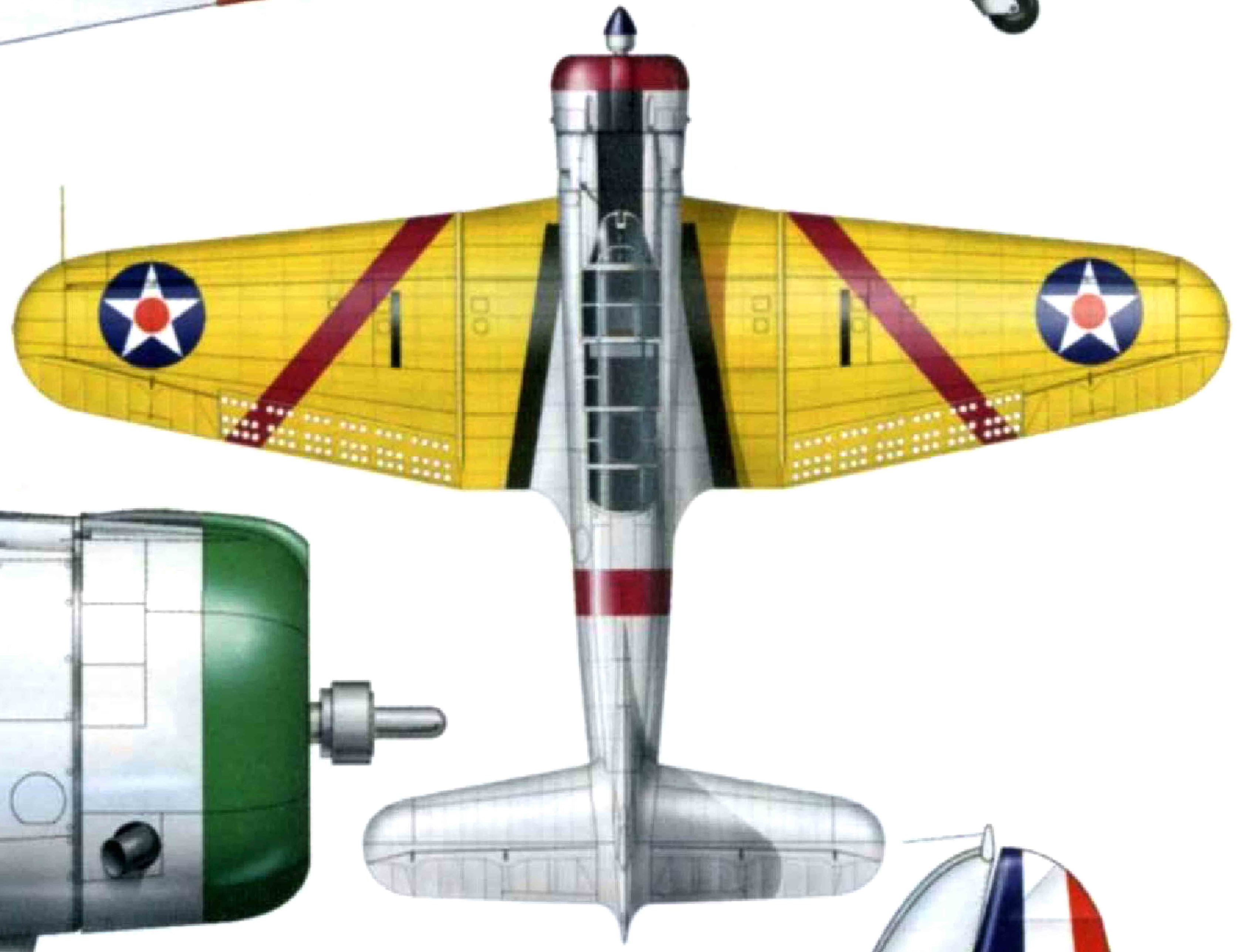
Whoever flew the Sea Hawk can testify to its ease of handling, viceless flying qualities and sheer thrill of being in control of a real 'pilot's aeroplane'. It did not afford too much power but the fact that it survived into the 1980s is proof of its worthiness. Luckily a few examples of this aircraft still survive in museums, as a witnesses to the real birth of jet aviation in British naval service. The Malta Aviation Museum acquired WV826 in 1999 and it now has pride of place at the entry to the older building. It brings back memories of the stunning displays over the Island, especially that of 1954 over *HMS Falcon* (RNAS Hal Far), with a mass formation take-off in the company of Sea Furies and Fireflies, producing no fewer than 40 aircraft in the air within minutes. Try to beat that, today! ■

Douglas SBD-1 Dauntless, BuNo.1603, 1-MB-1, flown by the commander of VMB-1, 1st Marine Air Group, Quantico NAS, 1940. Silver overall with Chrome Yellow wing upper surfaces; red bands around cowling, rear fuselage and chevrons on top of wings. Blue/white/red rudder vertical stripes; star markings on four wing positions. All lettering in black, except 'MB' on band which is in white; black anti-dazzle panel. USMC crest on fuselage sides

Model AIRPLANE INTERNATIONAL
Original Artwork by Richard J. Caruana © MAI 2006

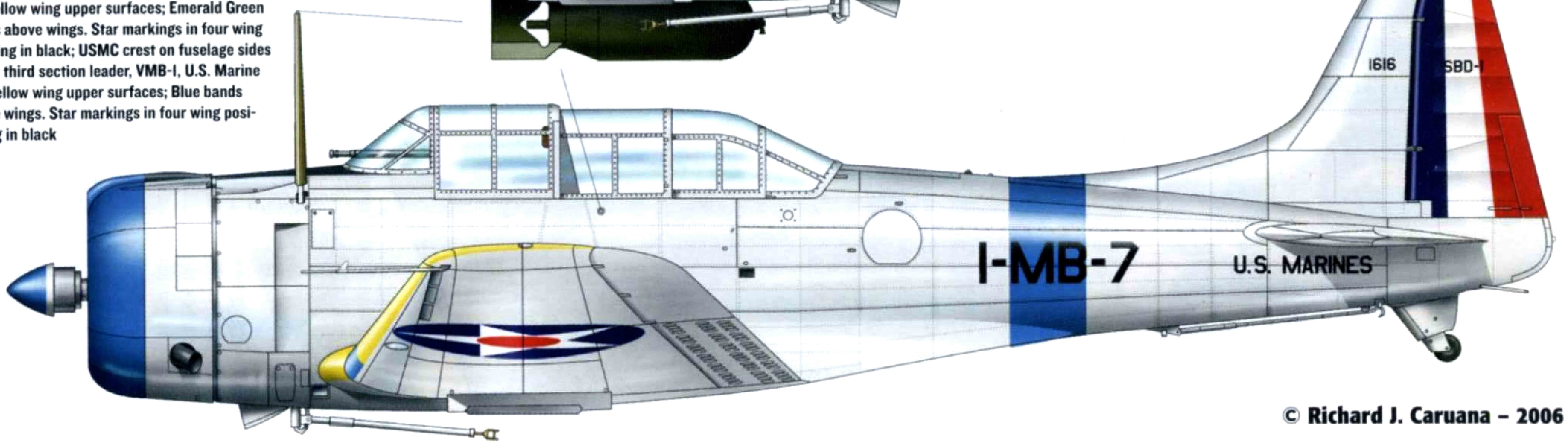




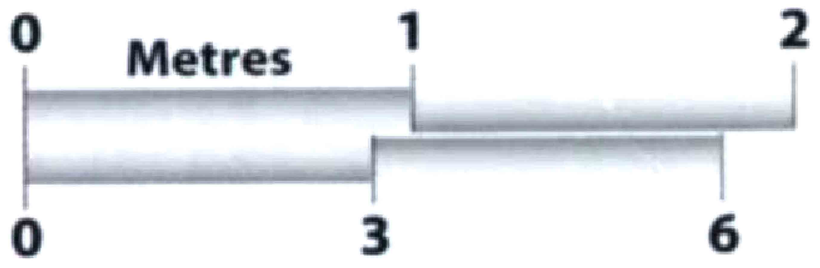


Above: Douglas SBD-1 Dauntless, BuNo.1741, 2-MB-13, flown by the fifth section leader of VMB-2 (MAG-21), US Marine Corps. Silver overall with Chrome Yellow wing upper surfaces; Emerald Green bands around front of cowling, rear fuselage and chevrons above wings. Star markings in four wing positions; blue/white/red vertical rudder stripes. All lettering in black; USMC crest on fuselage sides

Right: Douglas SBD-1 Dauntless, 1616/1-MB-7, flown by the third section leader, VMB-1, U.S. Marine Corps Air Group 11, Quantico. Silver overall with Chrome Yellow wing upper surfaces; Blue bands around front of cowling, rear fuselage and chevrons above wings. Star markings in four wing positions; blue/white/red vertical bands on rudder. All lettering in black



PROFILES 1:48 Scale



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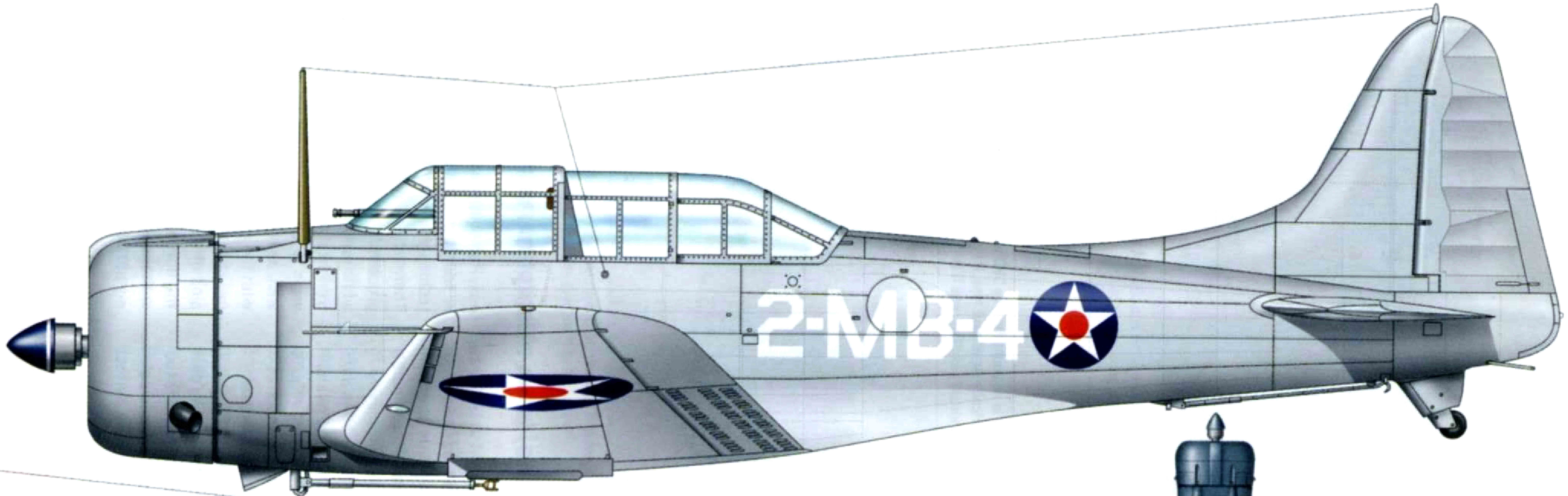
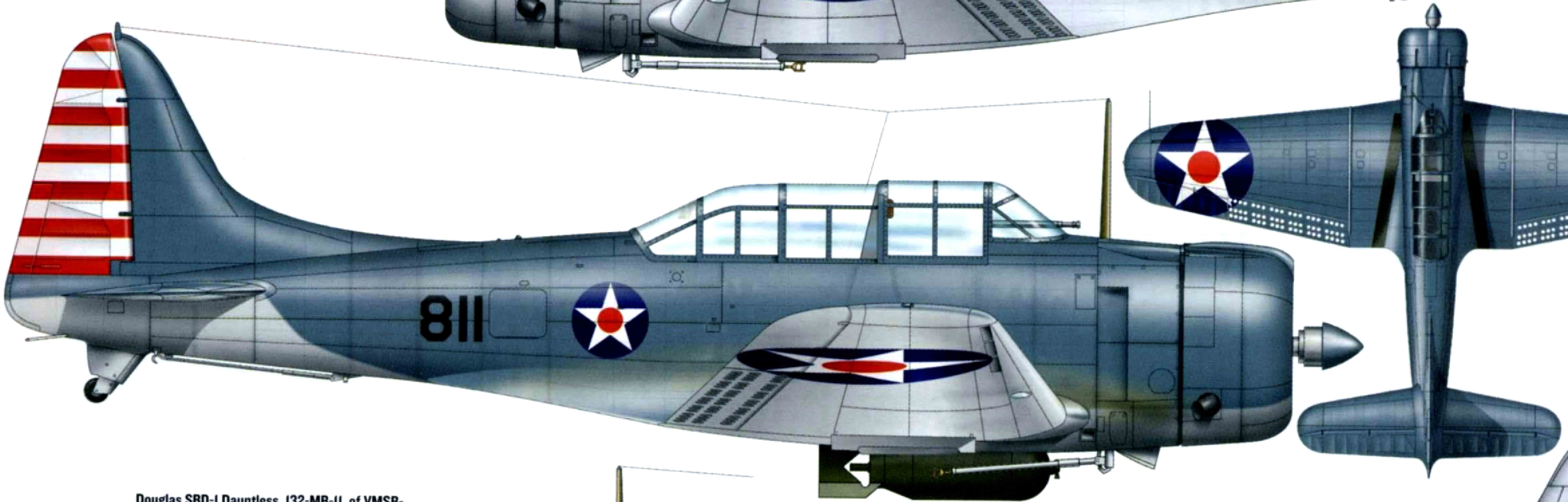
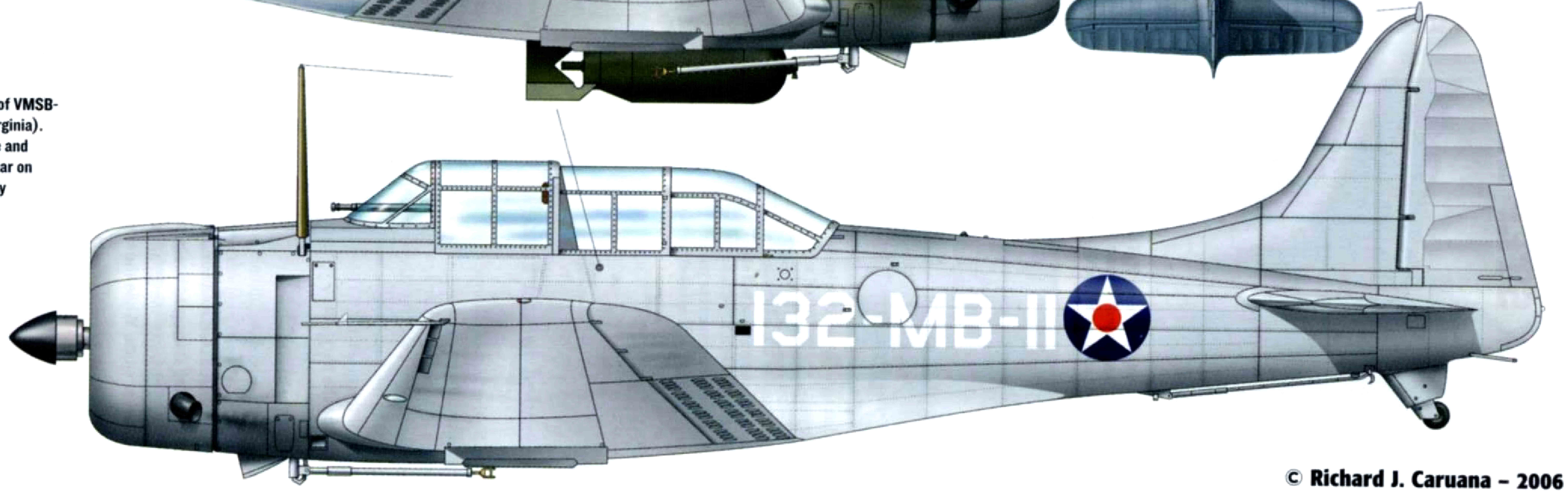
Right: Douglas SBD-1 Dauntless, 2-MB-4, VMSB-232, US Marine Corps, based at Ewa Oahu, (Hawaii), December 1941. Light Grey overall with standard national markings in six positions. Code 2-MB-4 in white; spinner is dark blue with a white stripe

Below: Douglas SBD-2 Dauntless, 811, VS-6, during the 'Revenge Raids' from *USS Enterprise*, early 1942. Blue Grey/Light Grey finish with red/white horizontal rudder stripes; star markings in six positions, with the full-chord length wing roundels. Code in black; note asymmetric size of wing roundels (detail far right)





Douglas SBD-1 Dauntless, 132-MB-11, of VMSB-132, Marine Air Group II, Quantico (Virginia). Light Gull Grey overall with white code and black spinner. National markings appear on fuselage sides and on top of wings only



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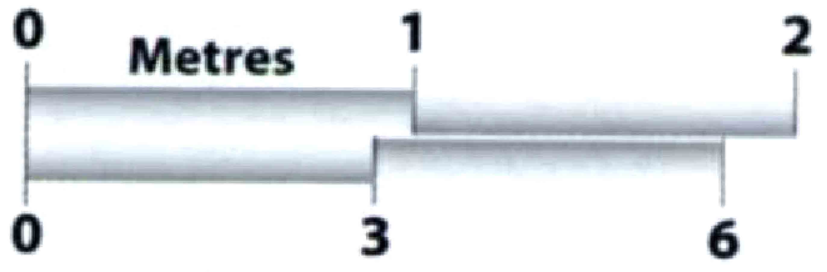

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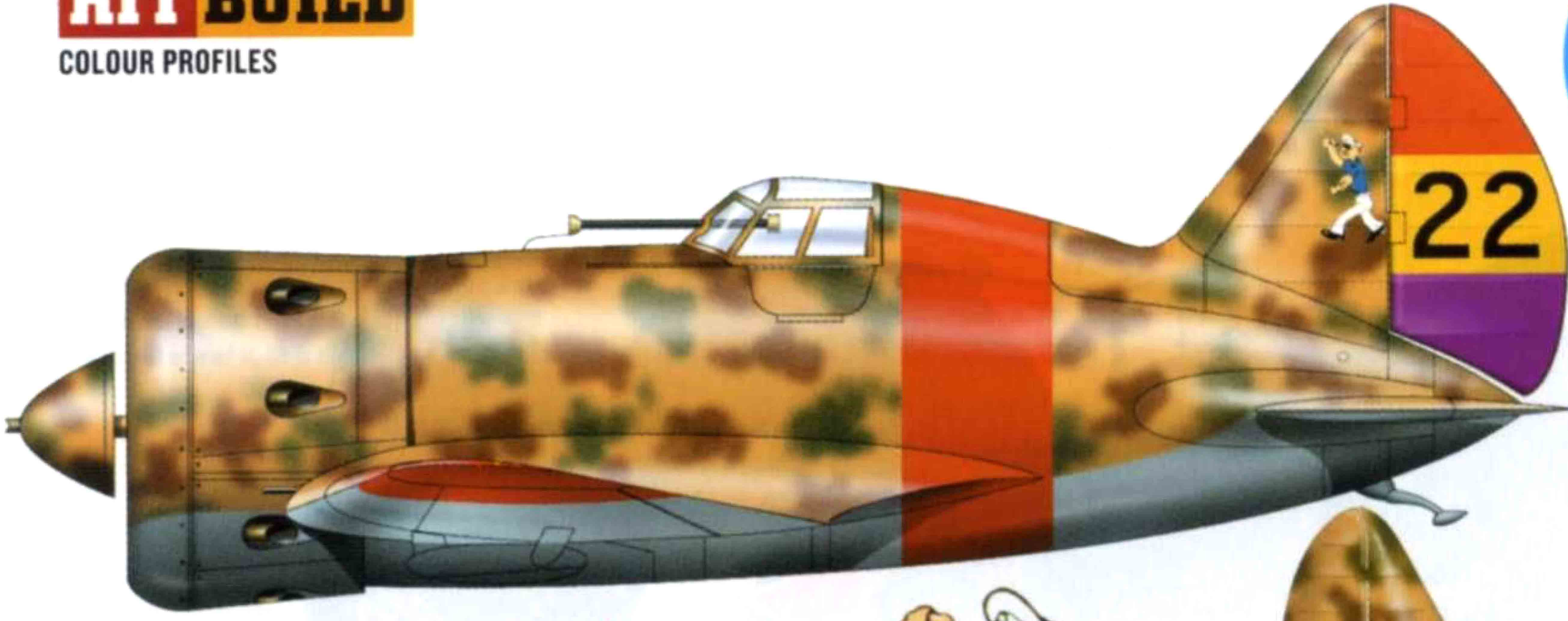

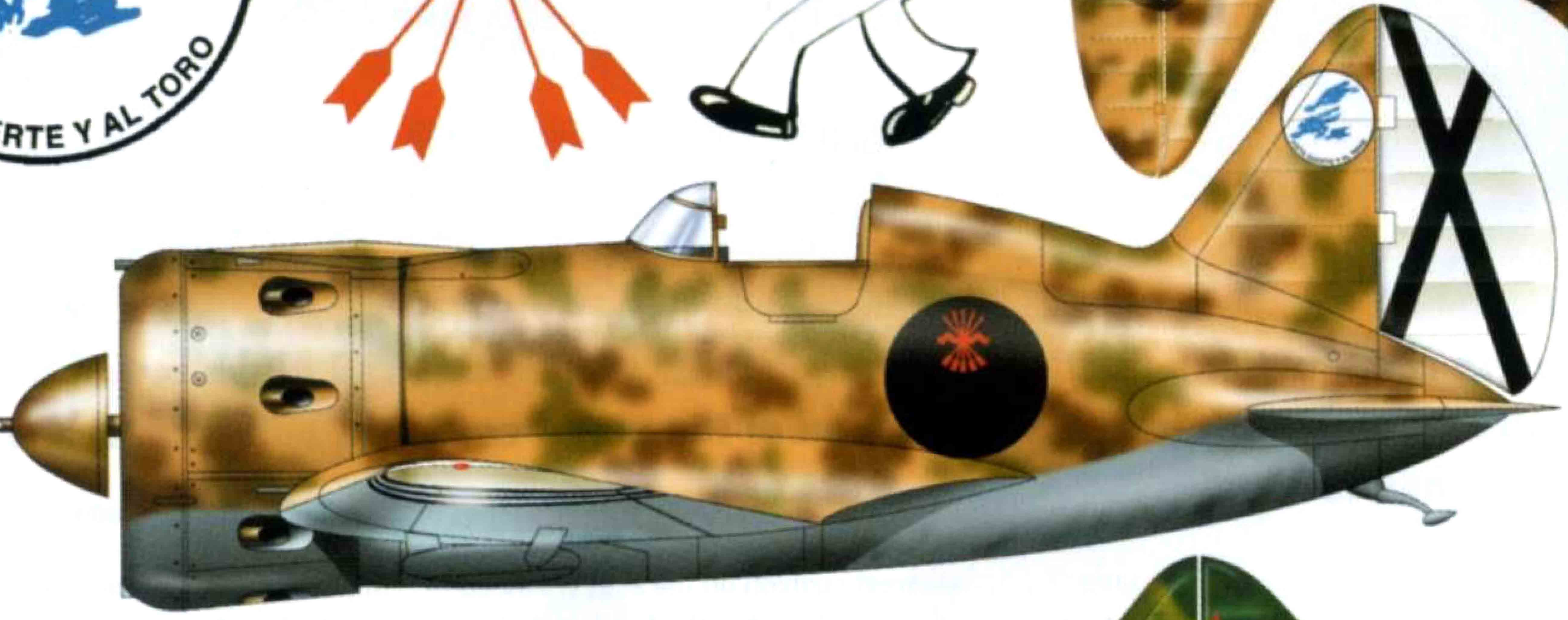

Top Left: Polikarpov I-16 Type 5, of 4a Escuadrilla of the Spanish Republican Air Force during the Civil War, 1938. Note the Popeye emblem on fin

Above: Polikarpov I-16 Type 10, captured by Spanish Nationalist forces. Sand/dark brown/olive green on upper surfaces with light blue-grey undersides; white wing tips and rudder, the latter carrying the black 'St Andew's' cross. Insignia of Joaquin Garcia Morato's 'Patrulla Azul' on fin. See upper view for wing markings

Above: Polikarpov I-16 Type 17, of the 4th Guards Regiment, Blatic Fleet based at Vystav, early 1942. Note that the upper surface finish consists of three types of green

Left: Polikarpov I-16 Type.24, 'II' flown by Russian 'ace' Boris F. Safonov, 72nd Aviation Regiment, Mummarsk, summer of 1941. The inscription on the fuselage reads 'Za Stalina!' (for Stalin). Another inscription on the starboard side read 'Smert Fashistam!' (Death to Fascism)

Polikarpov I-16 Type 29, 'I', Romanian Air Force. Dark green/light blue-grey finish with yellow spinner, wingtips and rear fuselage band; rudder flashes in blue/yellow/red. White 'I' on fin. Aircraft was captured on 8th July 1941 and used for combat training against IAR-39s and IAR-80s

Polikarpov I-16 Type 5, P2105, flown by Liu Chi Sheng, 21 Chungtui, Chinese Nationalist Air Force, Hankou, March 1938. Dark green/light blue-grey finish with white/blue striped rudder; national markings below wings only

Boeing-Vertol Chinook HC.1, ZA718/BN, No.18 Squadron, sole surviving HC.1 from 'Atlantic Conveyor', Falklands, 1982. Dark Sea Grey/Dark Green/black finish; all lettering in black, with code 'BN' repeated on front of forward rotor fairing. Unit badge carried on both sides of rear rotor fairing

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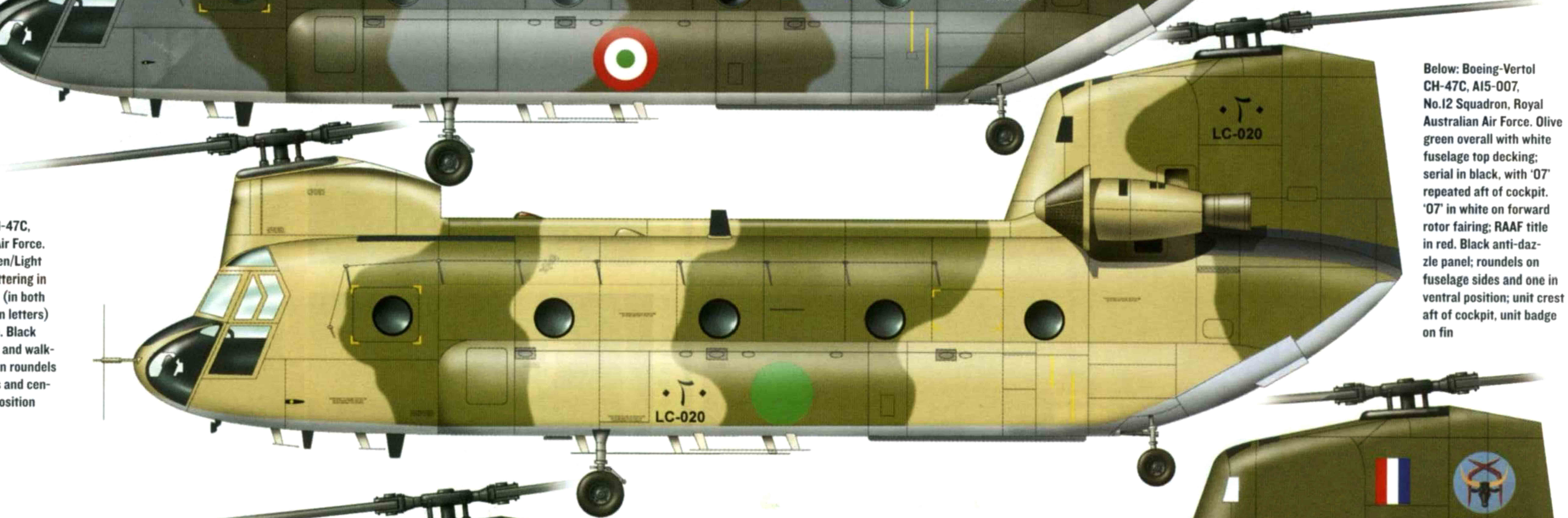
Above: Boeing Vertol Chinook HC.1, ZA705/EZ, No.7 Squadron, Royal Air Force, Beirut, 1984. Dark Green/Dark Sea Grey/black finish; all lettering in black with code 'EZ' repeated on front of forward rotor fairing. Union Jack on both sides of rear rotor fairing and below fuselage, ahead of front undercarriage legs

Right: Boeing-Vertol Chinook HC.1B, ZA671, No.7 Squadron, in a commemorative scheme, 75th Anniversary of the unit. Dark Sea Grey/Dark Green/black finish; all lettering in black. Rear rotor fairing is blue with light blue lettering and stars; light blue band edged in white below. Note style of '7' on fin

Agusta Meridionali/Boeing-Vertol CH-47C, MM.81441/EI.836, 12º Gruppo Squadroni, 1º Raggruppamento A.L.E., Italian Army, Viterbo. Dark Grey/Dark Green/silver finish; all lettering in white. Black anti-dazzle panel and walkways; Italian roundels on sides and one below fuselage (centrally, and in line with those on the fuselage). '836' repeated in white on nose



Boeing-Vertol CH-47C, LC-020, Libyan Air Force. Tan/Medium Green/Light Blue finish; all lettering in black, with serial (in both Arabic and Roman letters) repeated on nose. Black anti-dazzle panel and walkways; bright green roundels on fuselage sides and centrally in ventral position

Below: Boeing-Vertol CH-47C, AI5-007, No.12 Squadron, Royal Australian Air Force. Olive green overall with white fuselage top decking; serial in black, with '07' repeated aft of cockpit. '07' in white on forward rotor fairing; RAAF title in red. Black anti-dazzle panel; roundels on fuselage sides and one in ventral position; unit crest aft of cockpit, unit badge on fin

PHOTO FEATURE - CH-47

All photos © George Papadimitriou

This selection of images depicts Chinooks of the Dutch & Greek Air Forces

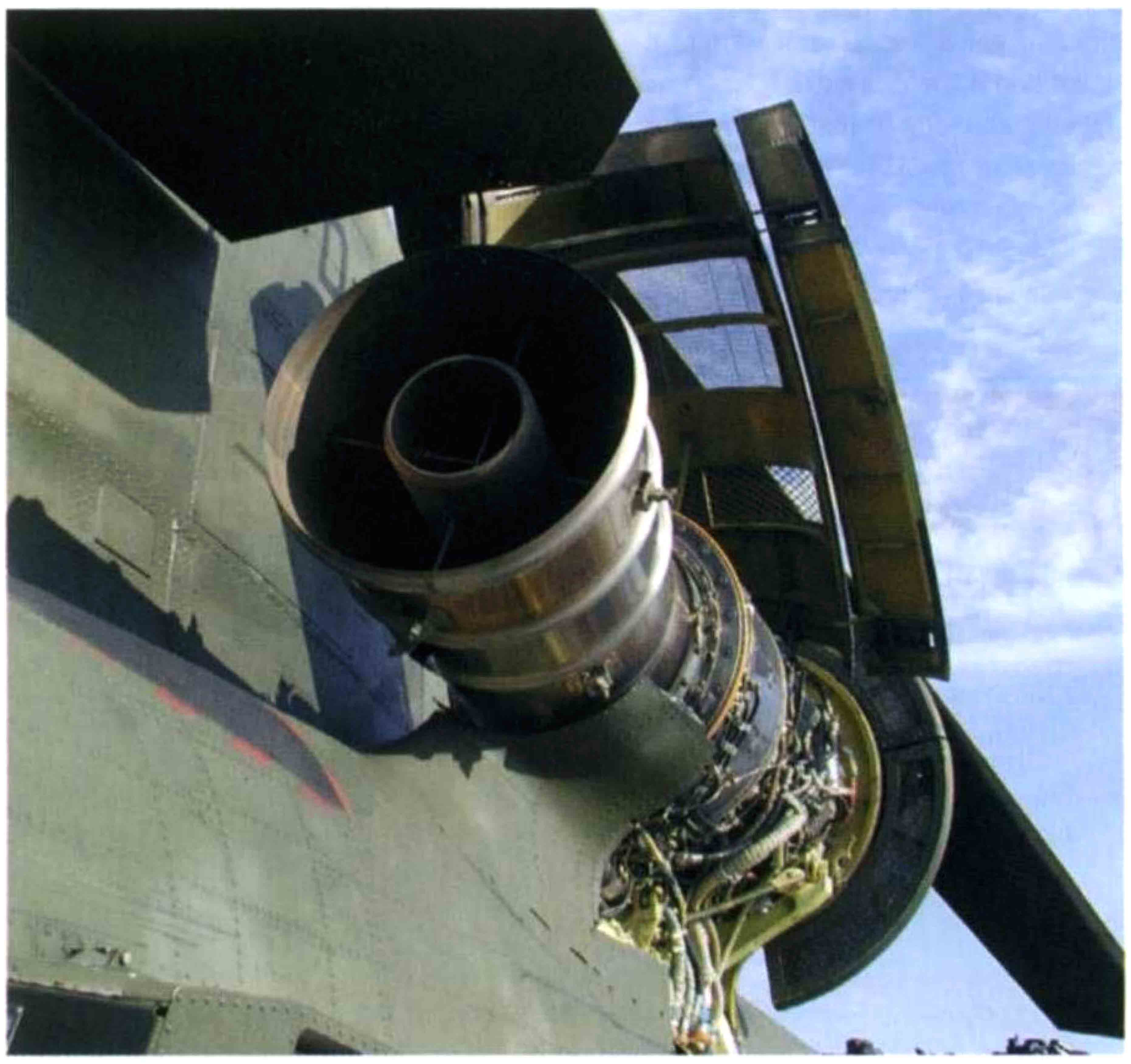
Port side view of a CH-47 operated by the Greek Air Force

One of the many ground access panels on the type, this one being above the front oleo unit on the starboard side

Close-up of the nose area with the crew access door folded down

Overall shot of the tail area with the access panels open on it and the engine

The large hinged access panel and working platform on the starboard side of the front rotor column



Useful image of the later-series engine fitted to the CH-47D, which was also retro-fitted to the A-series

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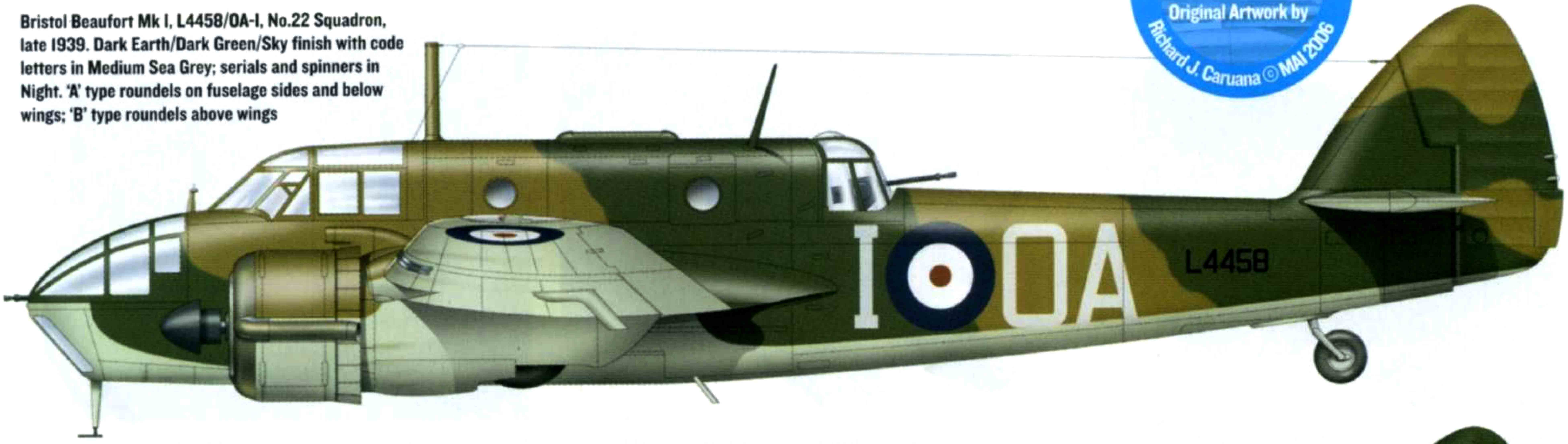
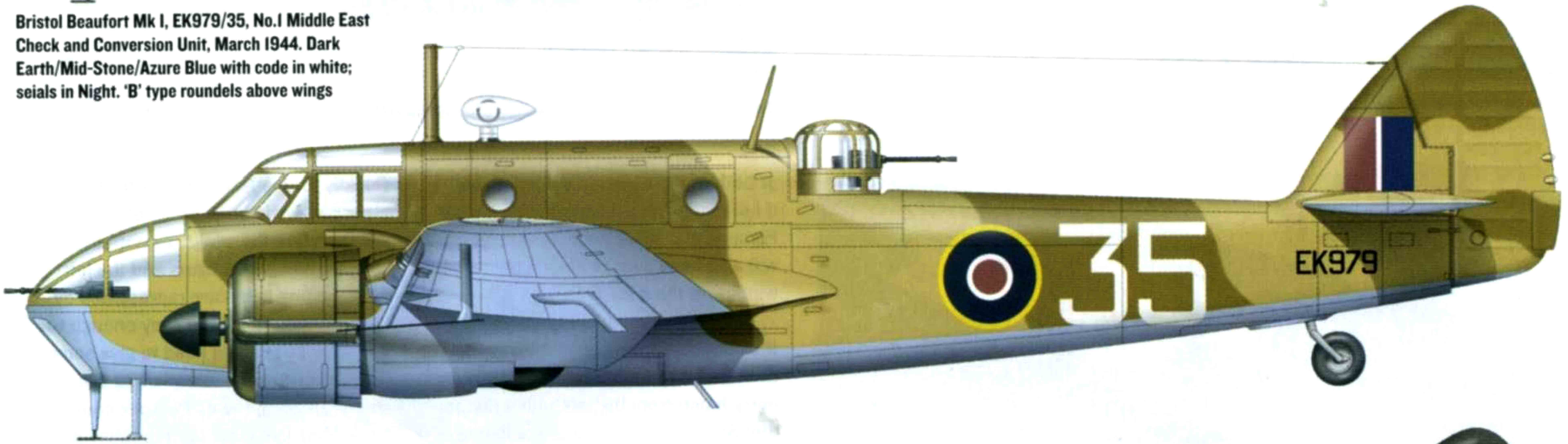
Bristol Beaufort Mk I, L4458/OA-I, No.22 Squadron, late 1939. Dark Earth/Dark Green/Sky finish with code letters in Medium Sea Grey; serials and spinners in Night. 'A' type roundels on fuselage sides and below wings; 'B' type roundels above wings

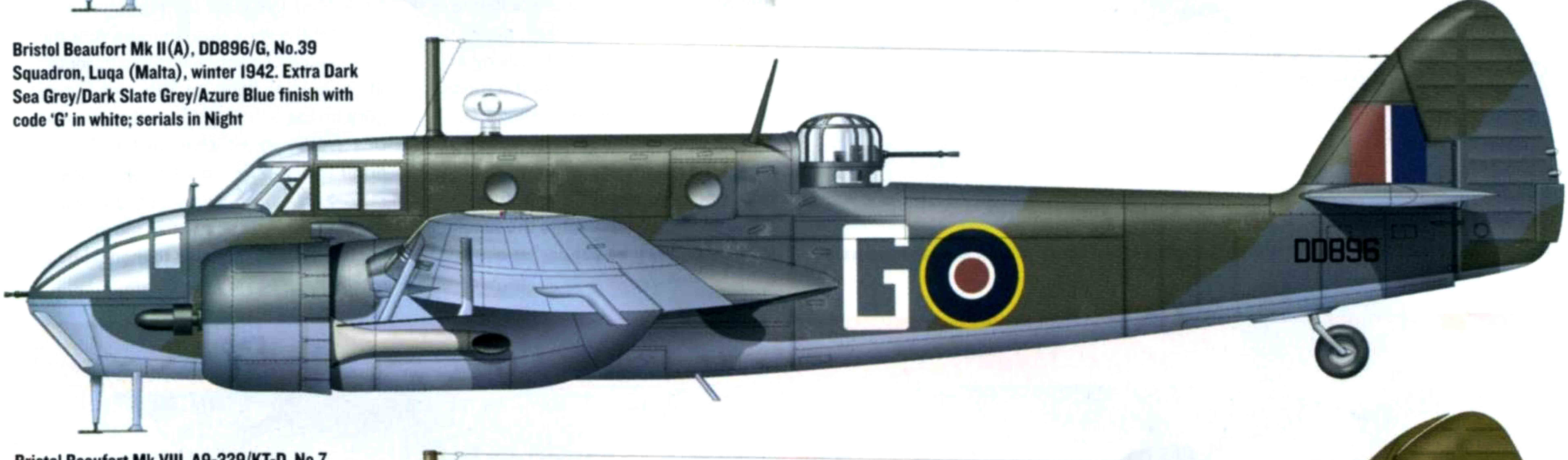


Bristol Beaufort Mk I, N1172/AW-S, No.42 Squadron, 1941. Dark Earth/Dark Green/Aluminium finish with codes in Medium Sea Grey; serials, spinners and 'S' on nose in Night. 'B' type roundels above wings

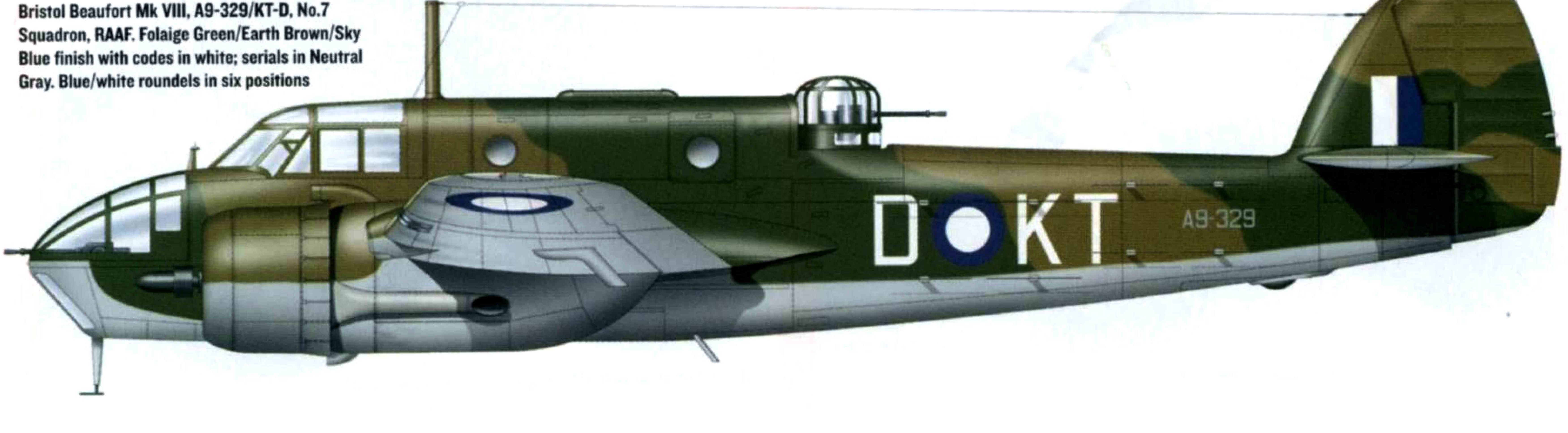
Bristol Beaufort Mk I, EK979/35, No.1 Middle East Check and Conversion Unit, March 1944. Dark Earth/Mid-Stone/Azure Blue with code in white; seials in Night. 'B' type roundels above wings



Bristol Beaufort Mk II(A), DD896/G, No.39 Squadron, Luqa (Malta), winter 1942. Extra Dark Sea Grey/Dark Slate Grey/Azure Blue finish with code 'G' in white; serials in Night



Bristol Beaufort Mk VIII, A9-329/KT-D, No.7 Squadron, RAAF. Folaige Green/Earth Brown/Sky Blue finish with codes in white; serials in Neutral Gray. Blue/white roundels in six positions



ROSATELLI'S ROCKET

BUILT & WRITTEN BY
RICHARD J CARUANA

Certainly the best-known biplane from the famous Fiat line of aircraft designed by Celestino Rosatelli (CR.1 of 1923 to CR.42 of 1938), the CR.32 could be found in large numbers within units of the Regia Aeronautica at the time of the Spanish Civil War (1936-1939). It had also garnered a vast amount of publicity through the displays of the national aerobatic team, and established a series of world records.

Rosatelli was a cautious and brilliant designer who built his series of fighters by refining each one, a stage at a time, from the basic CR.10 powered by a 400hp Fiat A.20 engine, to the CR.20 and CR.20 Asso (the latter fitted with the 450hp Isotta Fraschini Asso) and the beautiful CR.30 of 1932 powered by a 600hp Fiat A.30. Fast and manoeuverable for its time, the CR.30 won the Dal Molin Cup at an early stage of its career but was built only in small numbers for service with the Regia Aeronautica due to work on the CR.32 being already at an advanced stage. One can, therefore, consider the CR.32 to be no more than a radical refinement of the CR.30, fitted with a new version of the Fiat A.30 (R.A.), a water-cooled 12-cylinder upright V in-line engine designed by Ing. Zerbi through experience gained whilst working on the Schneider Trophy powerplants. Rosatelli reduced the wing by nearly 5 m2, thus improving manoeuvrability. This move, however, reduced the fighter's range as fuel tankage in the upper wing had to be decreased.

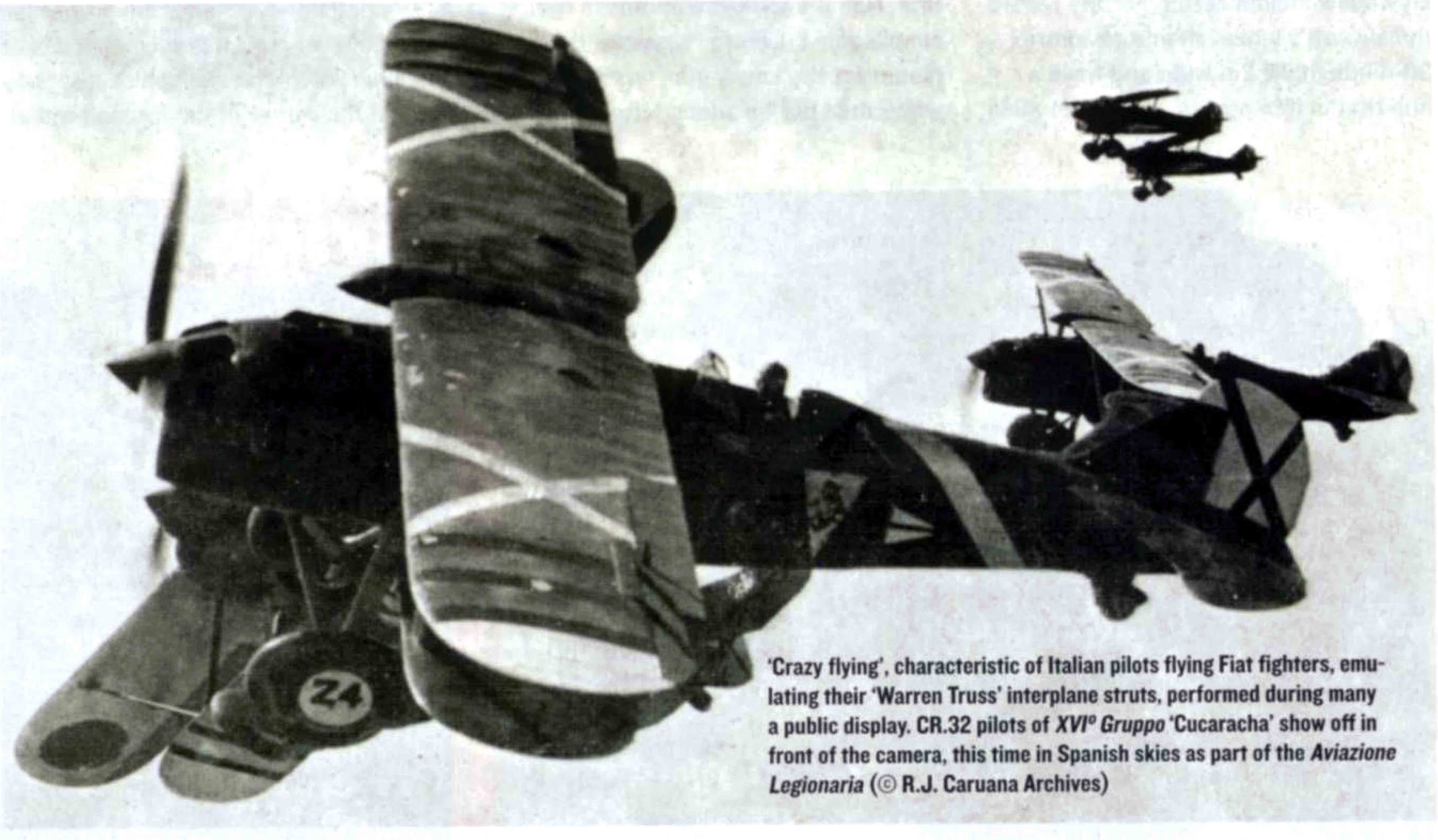
Francesco Brack-Papa took the prototype, MM.201, up for its first flight from Fiat's Aeritalia airfield in Turin on 28th April 1933. Official military evaluation of the prototype was soon followed by conspicuous production orders from the Regia Aeronautica, with the first batch of 50 machines (MM.2589-2638) being delivered between March and August of the following year. These were followed by 124 examples in 1935, 223 in 1936, 318 in 1937, 287 in 1938 and a final delivery of 50 machines in 1939, bringing total production to 1,052. These consisted of 282 *prima serie* (first series), 283 *bis*, 150 *ter* and 337 *quarter* versions. Armament of the CR.32 consisted of a pair of 12.7mm machine guns above the nose, synchronised to fire through the arc of the metal, twin-blade propeller. The bis version, however, could be identified through the additional installation of a pair of 7.7mm guns in the lower wings; this extra weight negatively affected the fighter's performance, and such an arrangement was discontinued on later versions.

As from March 1935, a number of CR.32s were awaiting delivery to the *Regia Aeronautica*. These were soon re-equipping a number of frontline units, including 4° *Stormo* at Gorizia, 1° *Stormo* at Campoformido and 3° *Stormo* at Bresso. By May of the following year the type could be found equipping 2° *Stormo*, 53° *Stormo* at Mirfiori and 52° *Stormo* at Ghedi. Conversion to the CR.32 proved uneventful, and units soon settled down to their routine on the new mounts. But not for long...

IN SPANISH SKIES

T by sea at the Moroccan port of Melilla in mid-August 1936 and were transferred to Tablada after the aircraft had been reassembled and flight-tested at Nador airfield. These aircraft formed the nucleus of the *Aviazione Legionaria* that was to provide an essential contribution to General Franco's eventual victory.

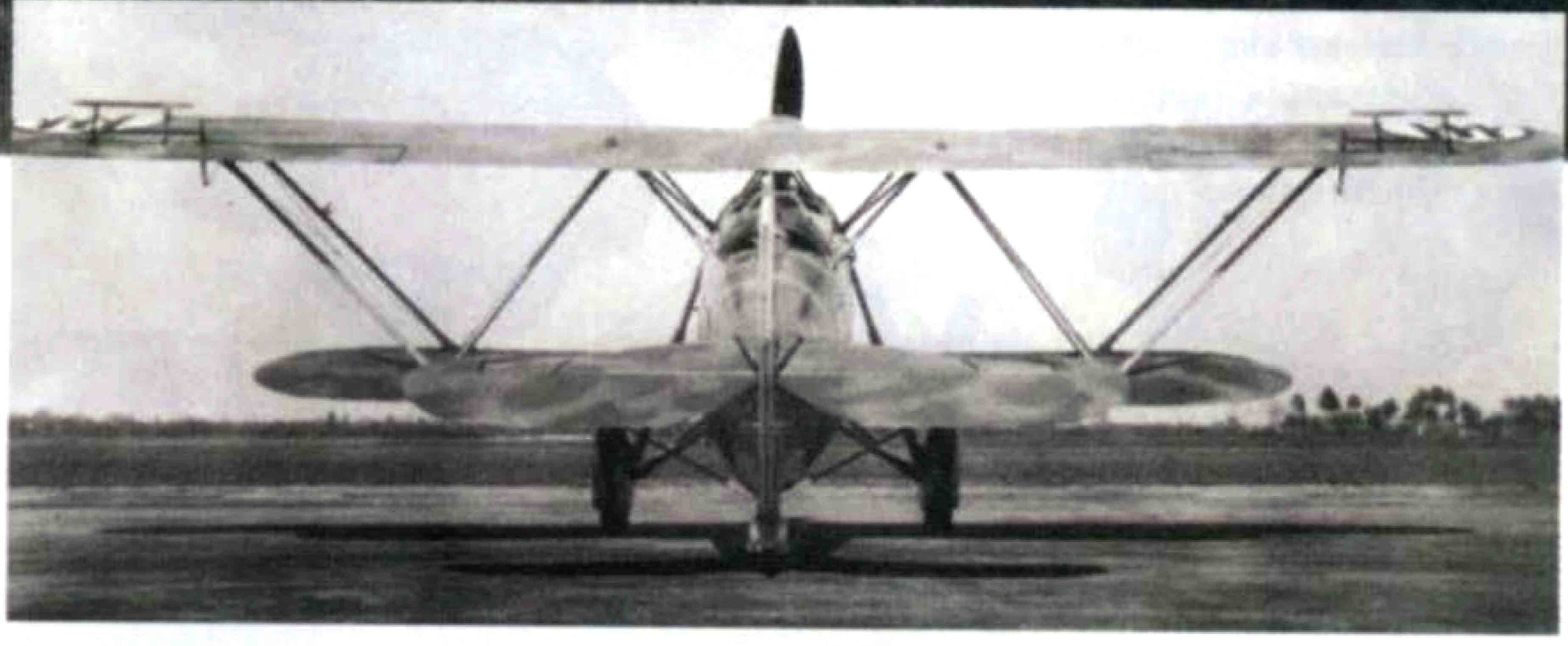
By the 21st of that same month, the CR.32s were already operational, scoring their first victory with the shooting down of a Nieuport 25 over Cordoba. The arrival of more CR.32s enabled the fighter element of the *Aviazione Legionaria* to be organised into the 3° *Stormo Caccia*, which consisted of the *VI Gruppo* 'Gamba di Ferro' (31, 32 & 33 *Squadriglie*), the *XVI Gruppo* 'Cucaracha' (24, 25 & 26 *Squadriglie*) and the *XXIII Gruppo* 'Asso di Bastoni' (18, 19 & 20 *Squadriglie*). A further two autonomous units were formed on the CR.32, namely the *Squadriglia Autonoma Mitragliamento* 'Frecce' and *X Gruppo Autonomo Caccia* 'Baleari' (101 & 102 *Squadriglie*). A total of 405 CR.32s found their way to Spain, nearly half of the total production, of which 73 were lost in action. Very soon the CR.32 pilots were encountering new Soviet types that were not as easy to intercept and shoot down as the earlier, older aircraft types flown by the Republicans. They suffered quite a setback with the appearance of the Tupolev SB 2, and the even more formidable I-16 *Rata* appeared during October-November 1936. On 2nd November Ten. Adriano Mantelli, popularly known as 'Arrighi', dispelled the myth surrounding the new Soviet types by shooting down an SB 2 over Talavera de la Reina; he had been observing the route these bombers were using, waited for their passage and dived from a high position. The rudder from the downed bomber was sent to Amadeo, Duke of Savoia (later Italian Governor-General of Italian East Africa), with the inscription 'La Caccia Non Serve' ('There is no need for fighter aircraft'), a comment aimed at a high-ranking group of officials advocating the strategic importance of the bomber and its invincibility in modern warfare. Notwithstanding the CR.32's deficiencies in speed and armament,



'Crazy flying', characteristic of Italian pilots flying Fiat fighters, emulating their 'Warren Truss' interplane struts, performed during many a public display. CR.32 pilots of *XVI° Gruppo* 'Cucaracha' show off in front of the camera, this time in Spanish skies as part of the *Aviazione Legionaria* (© R.J. Caruana Archives)

Second generation CR.32, the 'bis' version distinguishable by the 7.7mm wing guns installed in the lower wings. A pair of 12.7mm guns can be seen fitted on top of the forward fuselage (© R.J. Caruana Archives)

An early production CR.32 finished in a three-tone camouflage scheme devised by Fiat using the 'Mimetico' series of colours (©R.J. Caruana Archives)



Experimentation with camouflage and markings, initiated during the Spanish Civil War, led to the stardisation of a three-tone mottled scheme as worn by this CR.32. This type of camouflage remained in use until replaced with a uniform top finish in dark green during the later stages of the Second World War (© R.J. Caruana Archives)

Italian pilots discovered the advantages of their higher experience and excellent training. Many names earned legendary status: Garcia Morato (35 victories) and Adriano Mantella, leading *Aviazione Legionaria* ace with 24 victories. At the end of February 1939, the air battles in Spain came to an end, the opposing force having fielded 550 I-15s, 275 I-16s, 210 SB 2s and a mixed bag of some 500 other aircraft. By that time, however, similar to the Italian contingent, these consisted of outdated equipment compared to the 400 German aircraft in use by the *Condor Legion*, which had availed itself of the situation to perform a full dress rehearsal for the conflict that was to follow.

Of special interest is the reintroduction, on an experimental basis, of camouflage on Italian aircraft. CR.32s at Caceres were the first to don a coat of paint over their shiny silver finish that had proved too easy to spot. A providential gale covered the parked aircraft with a coat of reddish sand, making them practically invisible from the air; the Italians soon followed nature's example, as aircraft soon emerged sporting a camouflage finish.

THRILLING THE CROWDS

The first official Italian aerobatic display was organised by 1° *Stormo* on 12th July 1928, at Rome's Littorio airport. To celebrate the arrival of the Bellanca Pathfinder of transatlantic aviators Roger Williams and Lewis Jancey, two three-ship formations and a reserve aircraft put up a spirited display using brand new Fiat CR.20 fighters on loan from 7° *Stormo*. 1° *Stormo* performed again at Milan in June 1930, then, on 14th September it took its new Fiat CR.20*bis* fighters on an epic tour of the Balkans, with superlative performances at Bucharest, Belgrade, Sofia, Istanbul, Athens, and Tirana, Albania. This initiated a golden age in Italian aerobatics, using Fiat fighters, that was to last up until the beginning of the Second World War. On 20th June 1937, the 4° and 6° *Stormo* performed at Budapest and then, on 24-25th July, took part in the Air Meeting at Zurich, where the Italian team placed second (by half a point!) amid thirteen competing national teams. On 21st August the units embarked twenty-one CR.32s on the merchant ship Gloriastella and sailed for Peru, the first leg of a tour of South America. Capitano Molinari led the Mirafiori group (formed from pilots of 53° and 3° *Stormo*), while Capitano Vida led the Campoformido group (formed from 1° *Stormo*). On 28th October, they performed at Los Cerillos Airport in Santiago, Chile. Ten aircraft then made a formation crossing of the Andes into Argentina, where the unit performed at Buenos Aires on 14th November. Two days later the CR.32s went to Montevideo and then by ship to Rio de Janeiro. On 10th January 1938, they performed their final South American display at Campo di Marte, San Paolo di Brazil.

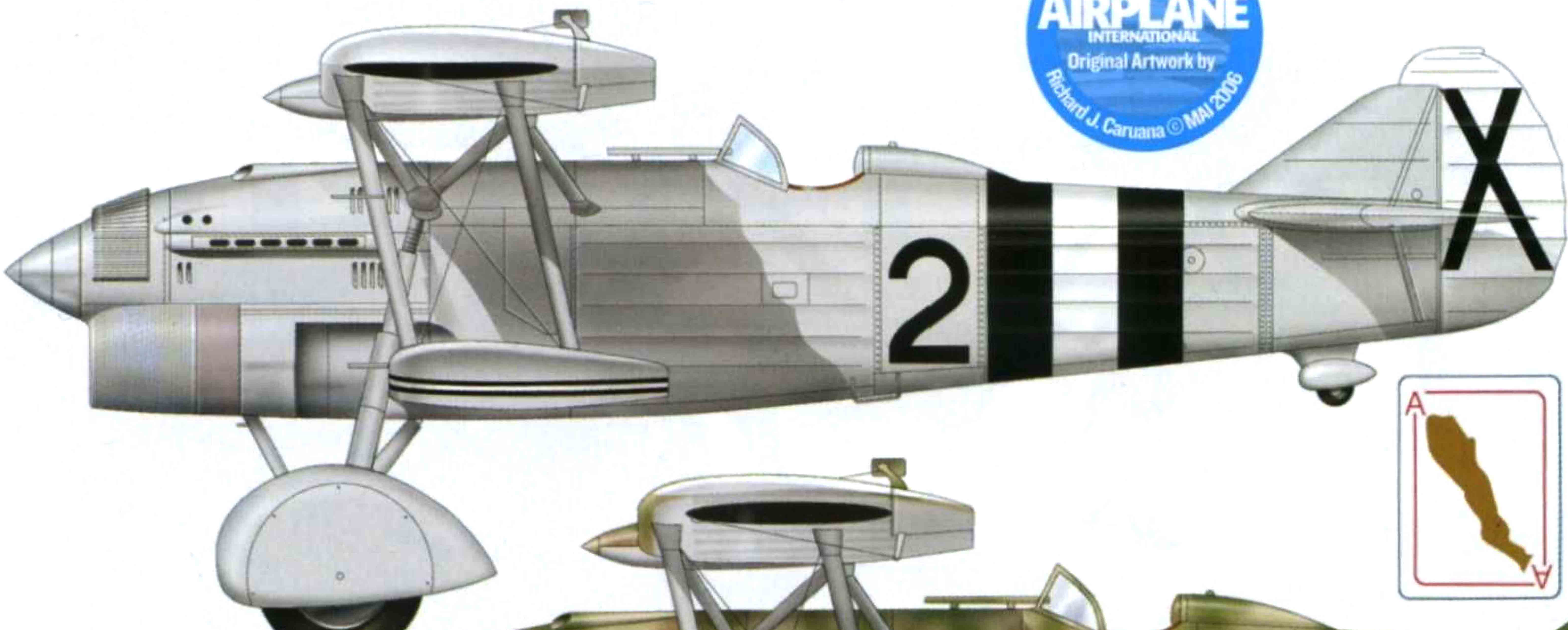
OBSOLESCENCE

The relative success gained by the CR.32 in Spain led high-ranking officials within the Regia Aeronautica to rest on their laurels, negatively slowing down aviation development in Italy with the delay of the monoplane's introduction. In fact, a handful of Fiat G.50s were the only other Italian fighters operating in Spain during the final stages of the civil war. Preference was given to further development of air-cooled radial engines, creating an enormous technological gap between the Fiat A.30 powering the CR.32 and the next in-line version to be adopted by the Italian wartime industry – the licence-built version of the Daimler Benz DB601. This led the *Regia Aeronautica* to have to rely heavily on biplanes (CR.32s and CR.42s) on Italy's entry into the Second World War, as 328 CR.32s were still to be found within frontline units. While the situation was not so critical close to home – with 3° *Gruppo* based in Sardegna, 2° *Gruppo* in Puglia, 160° *Gruppo* in Albania and 161° *Gruppo* in the Aegean – the situation in North Africa and Ethiopia soon became dramatic. To complicate matters, CR.32s from 2° *Stormo* in Libya were taken over and used in the ground-attack role by the 50° *Stormo Assolto*, as grave difficulties were found in operating the latter's Breda Ba.65s and Caproni Ca.310s. Fitted with racks for the carriage of small bombs, they were employed to counter armoured units harassing Italian ground forces until the loss of Cyrenaica in February 1941. CR. 32s of the 410 and 411 *Squadriglie* in East Africa formed about half the fighter element in that isolated region. Dwindling daily due to a high rate of attrition, these CR.32s managed to perform important tactical operations in Ethiopia.

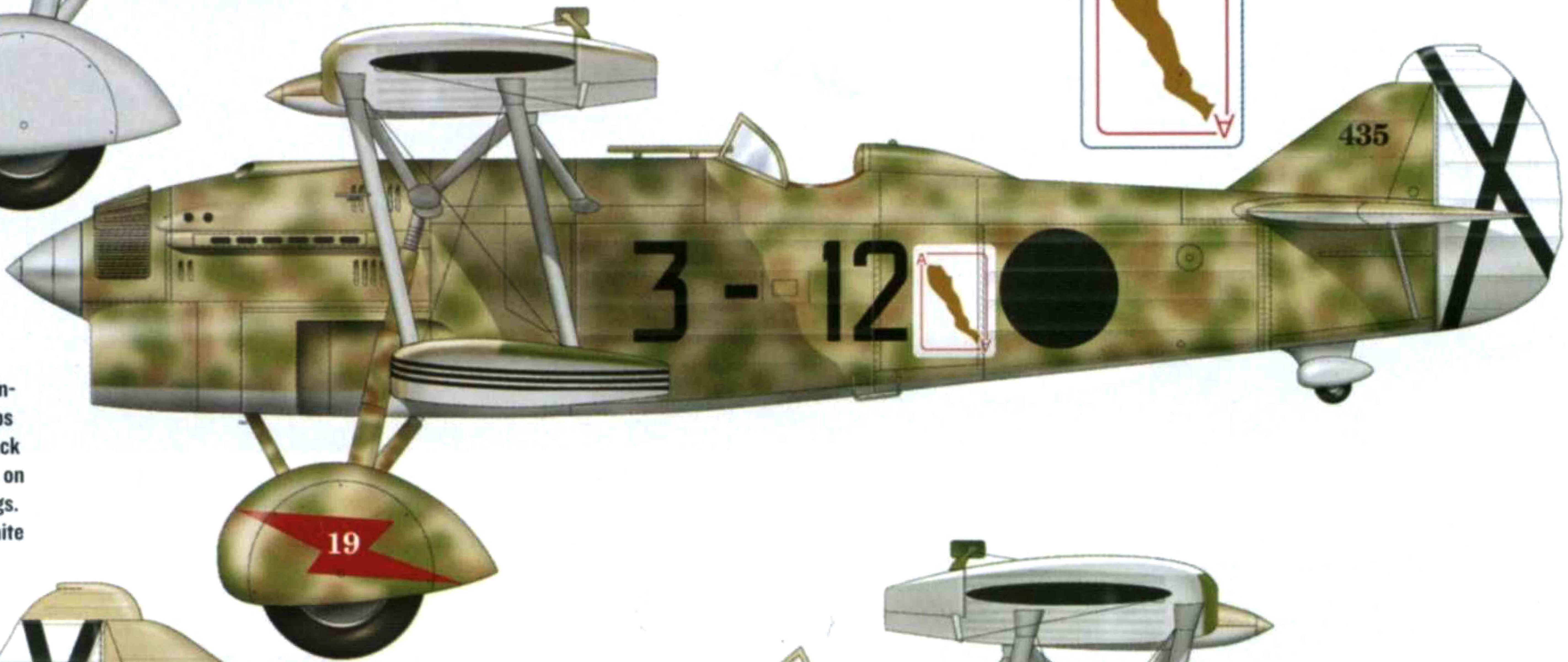
Eventually all CR.32s were relegated to training duties with flying schools at Gorizia, Rimini and Castiglione del Lago, notwithstanding their uneconomically high fuel consumption. While 231 CR.32s were on strength in December 1941, 152 examples were still available (on paper) on 31st July 1943.

Small numbers of CR.32s were sold to foreign operators, such as China, Venezuela and Paraguay. Twelve examples were acquired by Austria, which following the Anschluss of 1938 were taken over by the Luftwaffe. The only other major operator was Hungary, whose CR.32s were relegated to training duties after the acquisition of CR.42s and Reggiane Re.2000s. ■

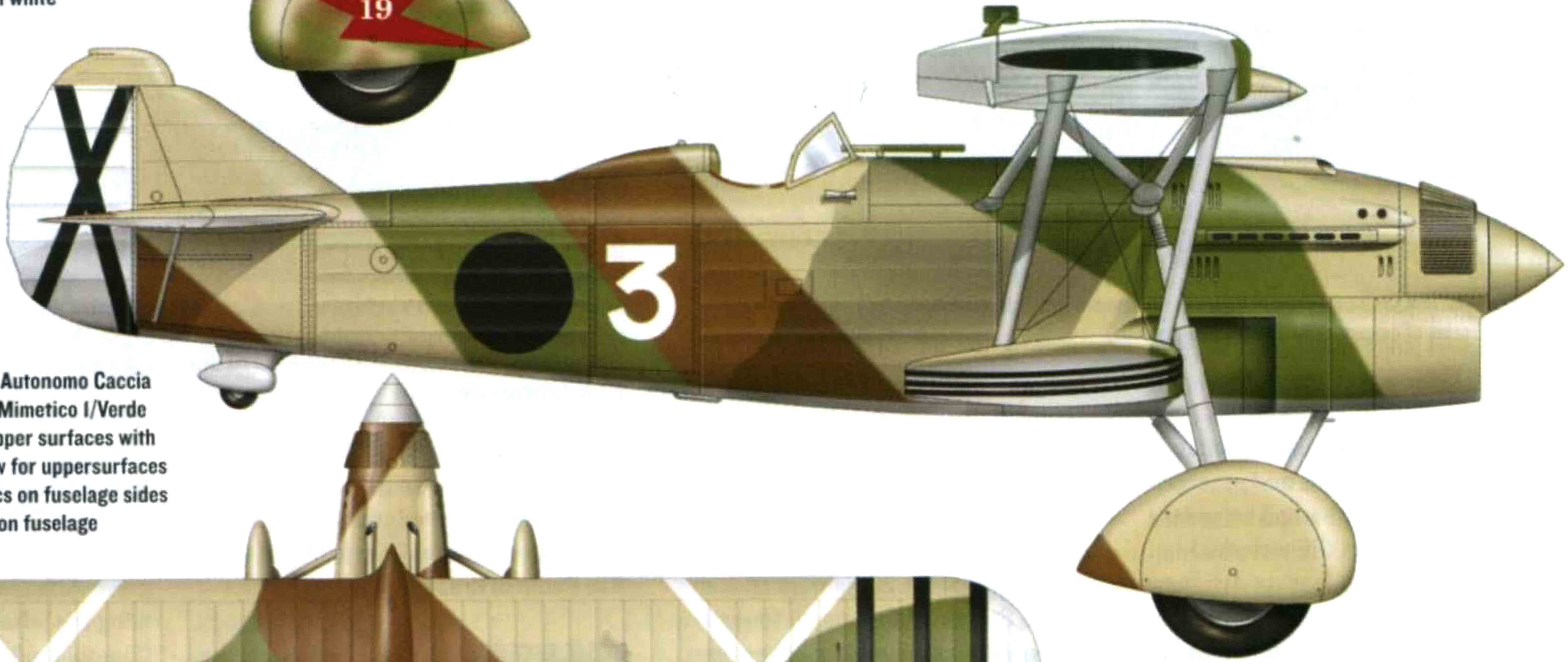
Model AIRPLANE INTERNATIONAL Original Artwork by Richard J. Caruana © MAI 2006



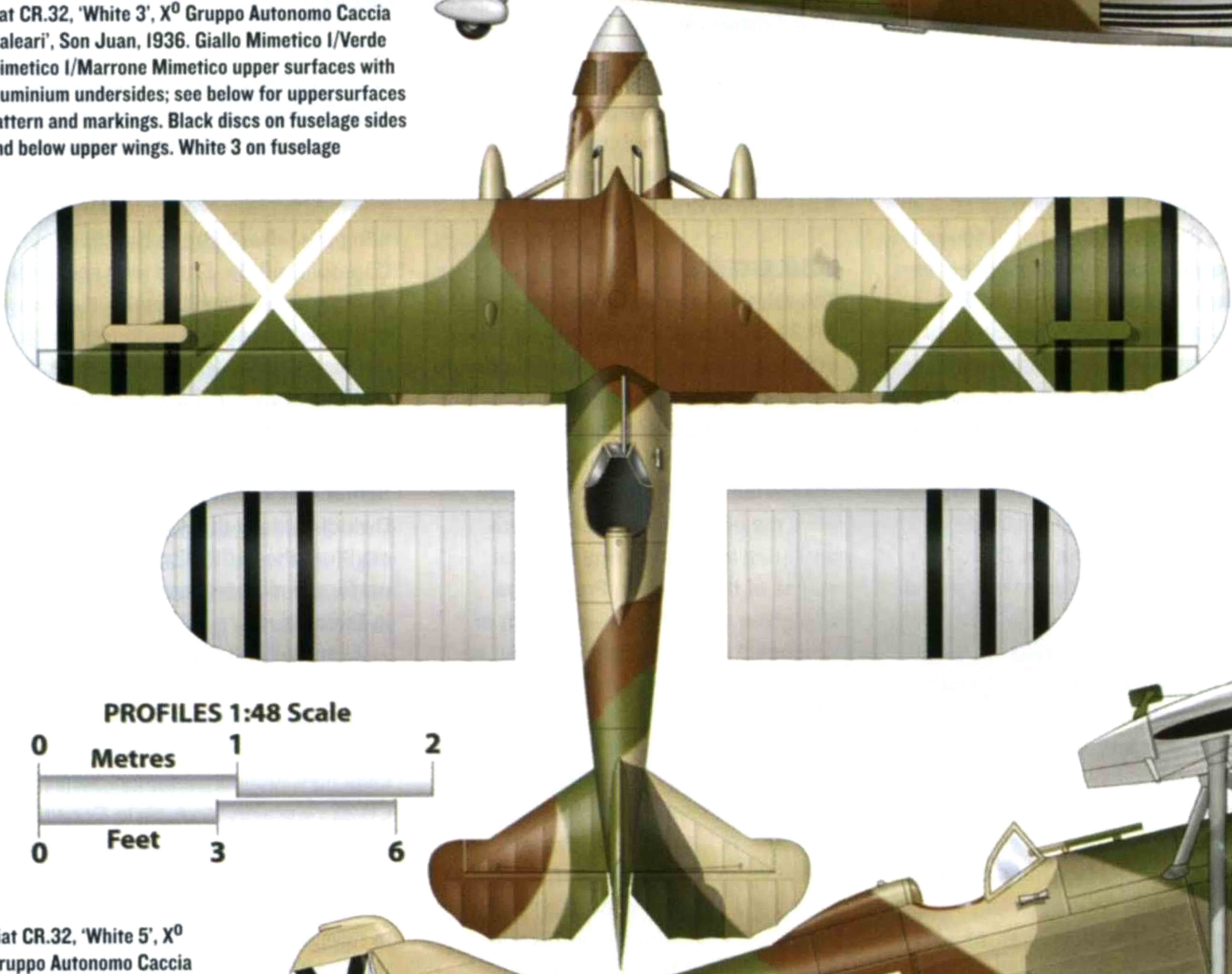
Fiat CR.32, '2', III° Stormo Caccia, Aviación de el Tercio, August 1936. Silver overall except for the polished metal areas; black/white/black bands on rear fuselage and below lower wings. White tips of top wings with black disc (above and below) and white 'St Andrew's Cross' above top wings further inboard; white rudder with black cross



Fiat CR.32, 435/3-12/19, 19ª Squadriglia of the XXIII° Gruppo Autonomo Caccia 'Asso di Bastoni', 1938. Giallo Mimetico I/ Verde Mimetico I/ Marrone Mimetico upper surfaces with aluminium undersides; White upper wingtips with two black bands above. Two black bands below lower wing; black discs on fuselage sides and below upper wings. Codes and serials in black; '19' in white over a red flash on wheel spat

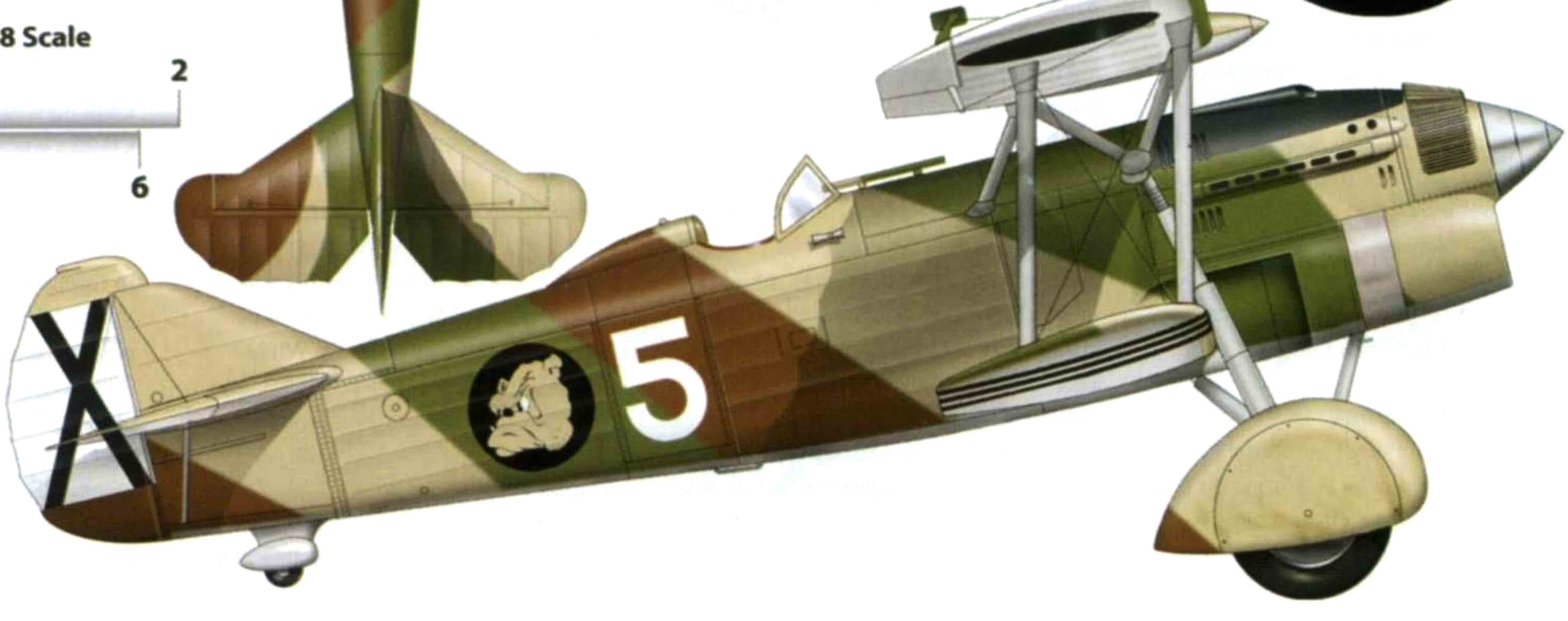


Fiat CR.32, 'White 3', X° Gruppo Autonomo Caccia 'Baleari', Son Juan, 1936. Giallo Mimetico I/Verde Mimetico I/Marrone Mimetico upper surfaces with Aluminium undersides; see below for uppersurfaces pattern and markings. Black discs on fuselage sides and below upper wings. White 3 on fuselage



PROFILES 1:48 Scale

Metres	0	1	2
Feet	0	3	6

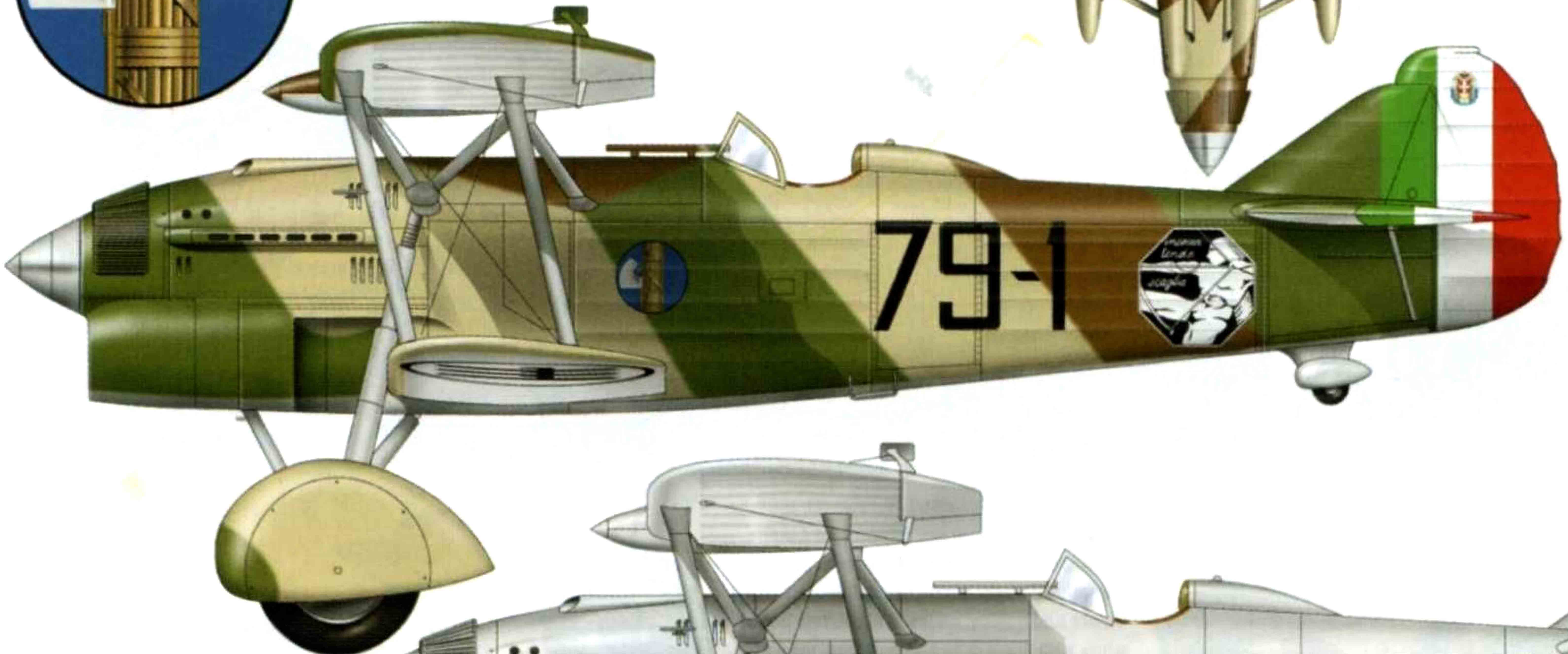


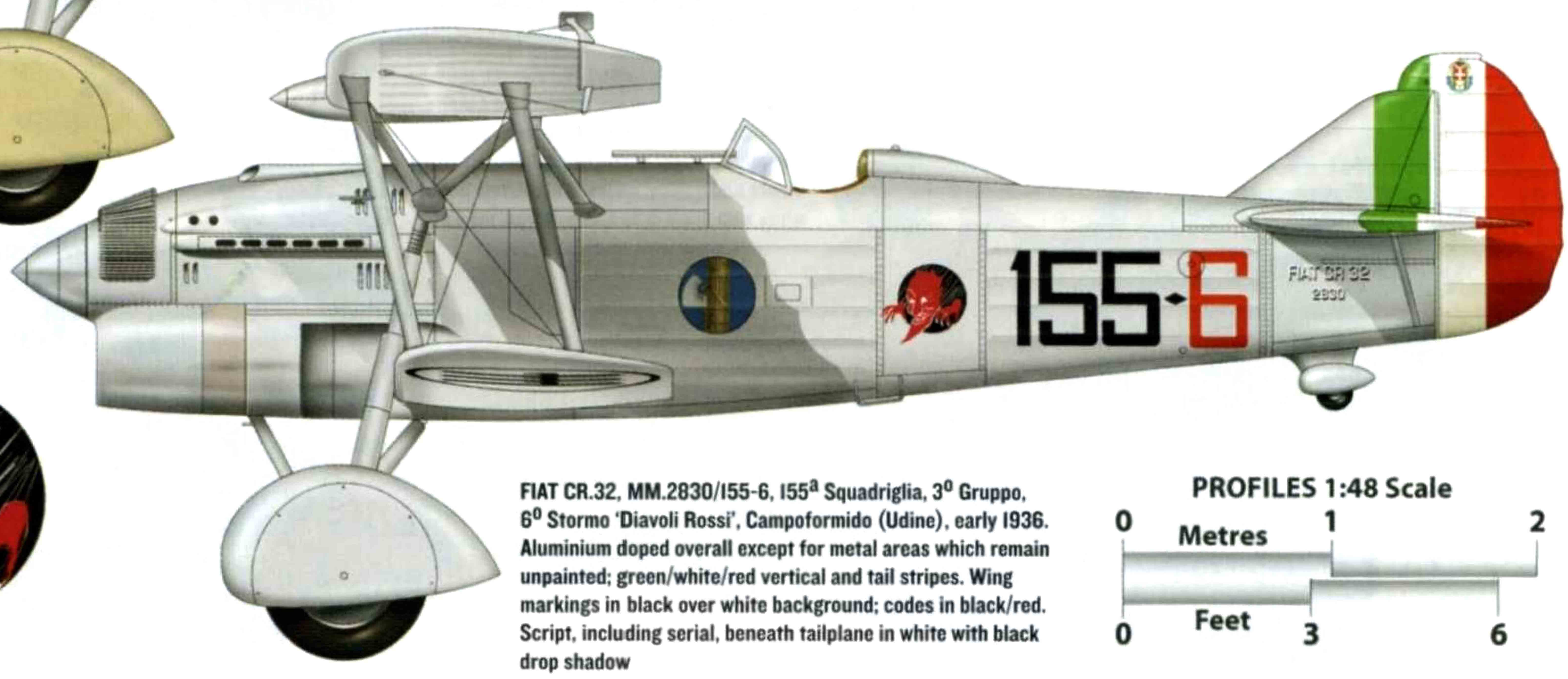
Fiat CR.32, 'White 5', X° Gruppo Autonomo Caccia 'Baleari', Son Juan, 1936. Finish and markings similar to 'White 3' above. Bulldog marking is carried on both sides

Fiat CR.32*bis*, 73-5, 73ª Squadriglia, 4º Stormo, particicant of the 3ª Giornata dell'Ala, Roma Littorio, 1936. Aluminium overall except for natural metal panels; codes in black. Green/white/red stripes on vertical and horizontal tail surfaces; serials in white with black drop shadow. Wing markings in black over white background; 4º Stormo badge on rear fuselage

Fiat CR.32, MM.3023/85-5, 85ª Squadriglia, 18º Gruppo, 3º Stormo, spring 1938. Aluminium on all surfaces except metal panels which remain unpainted; green/white/red stripes to vertical and horizontal tail surfaces. Codes in black; serial in white, with black drop shadow. The aircraft also carries the 30 Stormo badge and a Squadriglia commander's pennant. '3' in red and XVIII in black on fin; Wing markings in black over white background

Right and Below: Fiat CR.32, 79-1, 79ª Squadriglia, 6º Gruppo, 10 Stormo, 1936. Upper surfaces in bands of Giallo Mimetico I/Verde Mimetico I/Marrone Mimetico with aluminium undersides; spinner in natural metal. Green/white/red stripes on vertical and horizontal tail surfaces; Io Stormo badge on rear fuselage





FIAT CR.32, MM.2830/155-6, 155ª Squadriglia, 3º Gruppo, 6º Stormo 'Diavoli Rossi', Campoformido (Udine), early 1936. Aluminium doped overall except for metal areas which remain unpainted; green/white/red vertical and tail stripes. Wing markings in black over white background; codes in black/red. Script, including serial, beneath tailplane in white with black drop shadow

PROFILES 1:48 Scale

0 Metres 1 2

0 Feet 3 6

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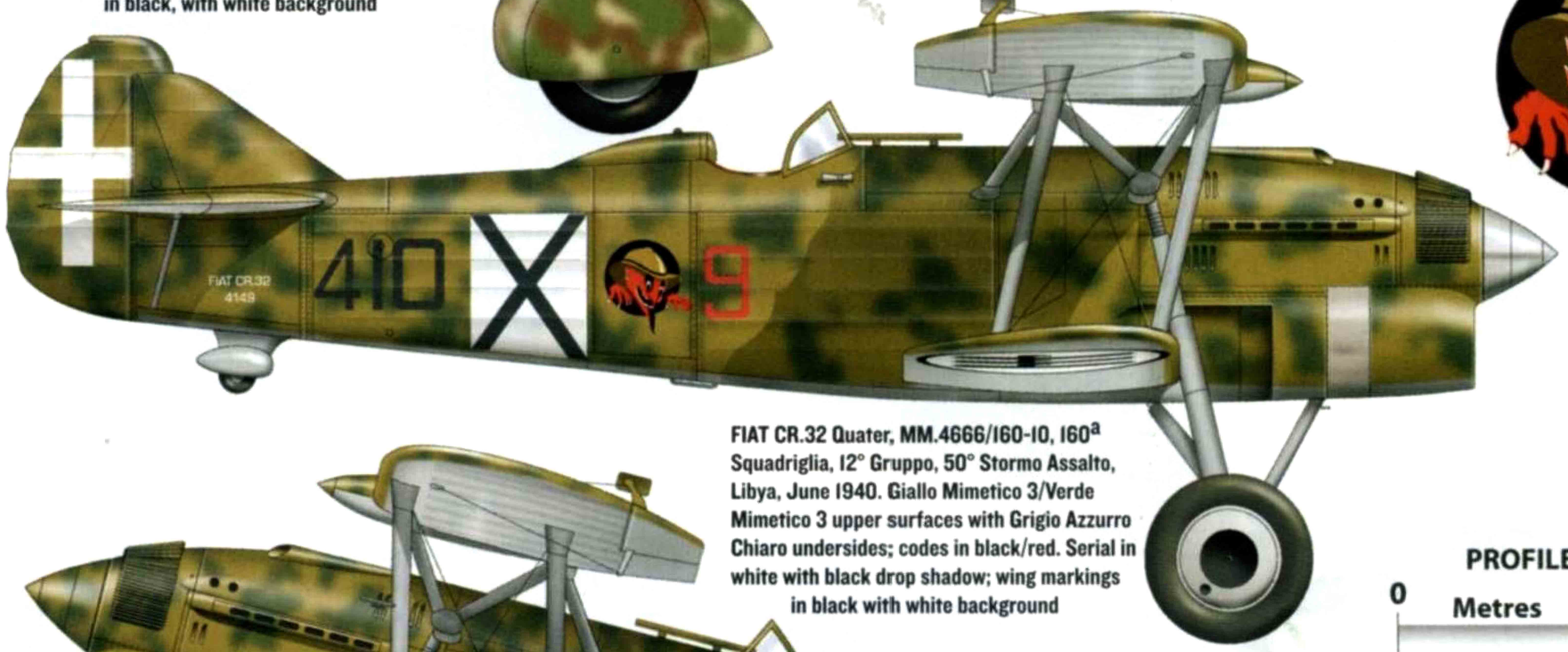
Fiat CR.32, 358-I, 358ª Squadriglia, 22º Gruppo, 52º Stormo, Chedi, autumn 1936. Giallo Mimetico 3/Verde Mimetico 3 upper surfaces with Grigio Azzurro Chiaro undersides; codes in black/red. Rudder stripes in green/white/red; spinner natural metal. Unit badge on fuselage; note Squadriglia commander's pennant. Wing markings in black over a white background

Fiat CR.32 *Quater*, MM.4070/364-7, 364ª Squadriglia, 150º Gruppo, 53º Stormo, Caselle Torino, autumn 1938. Upper surfaces in Giallo/Verde/Marrone Mimetico colours with Aluminium undersides; codes in black/red, serial in black. Rudder stripes in green/white/red; wing markings in black with white background

Fiat CR.32, MM.2856/360-3, 360ª Squadriglia, 52º Stormo, Ponderosa (Pisa), summer 1939. Giallo Mimetico 1/Verde Mimetico 1/Marrone Mimetico upper surfaces with Aluminium undersides; codes in black/red. Rudder stripes in green/white/red; national markings in black over white background. Spinner natural metal with red tip



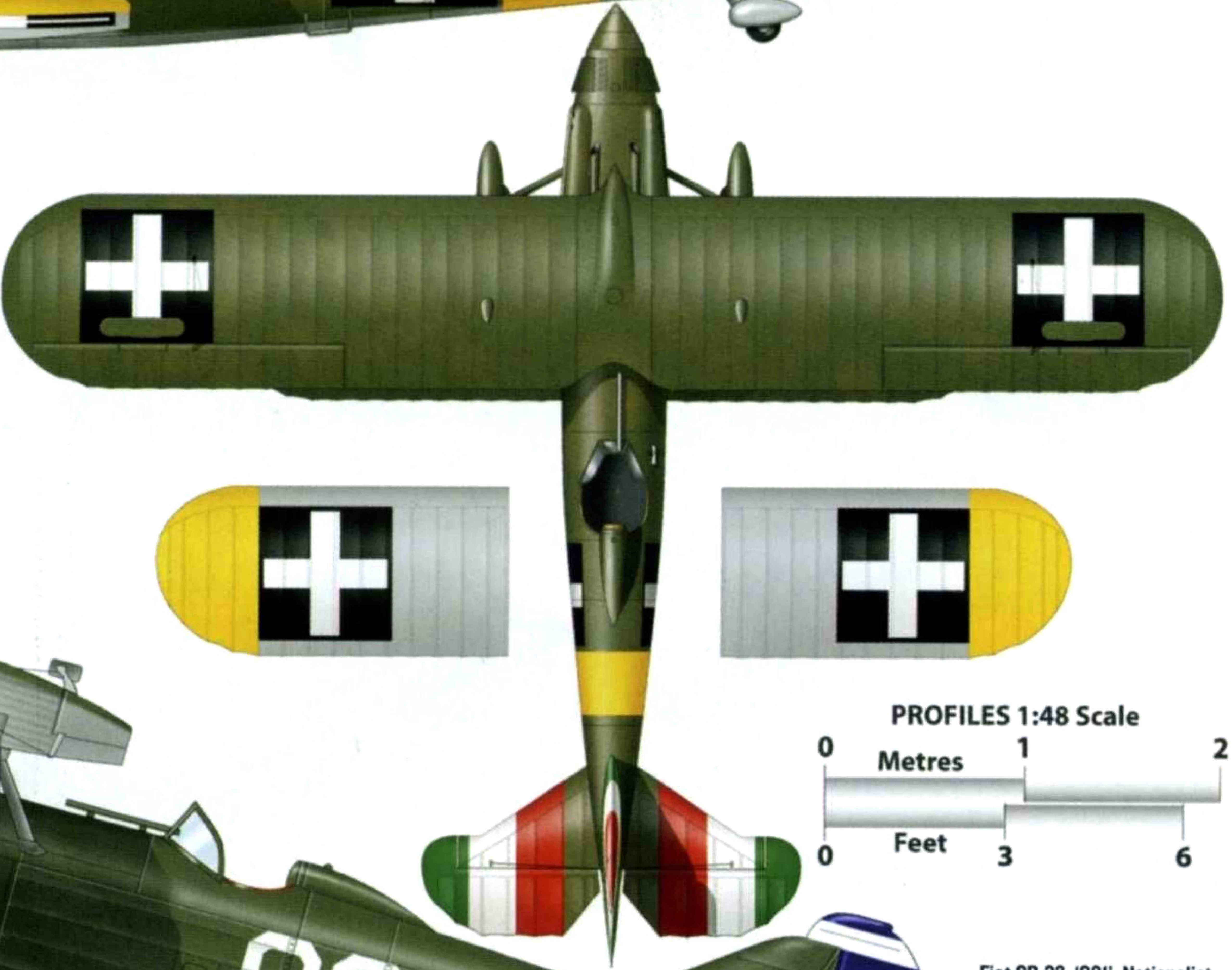
Fiat CR.32, MM.4149, 410ª Squadriglia Addis Abeba, winter 1940-41. Giallo Mimetico 3/Verde Mimetico 3 upper surfaces with Grigio Azzurro Chiaro undersides; codes in black/red, serial in white. White panel on fuselage sides, with black 'St Andrew's' cross superimposed; white cross on rudder, natural metal spinner. Wing markings in black, with white background

FIAT CR.32 Quater, MM.4666/160-10, 160ª Squadriglia, 12° Gruppo, 50° Stormo Assalto, Libya, June 1940. Giallo Mimetico 3/Verde Mimetico 3 upper surfaces with Grigio Azzurro Chiaro undersides; codes in black/red. Serial in white with black drop shadow; wing markings in black with white background

PROFILES 1:48 Scale
Metres 0 1 2
Feet 0 3 6

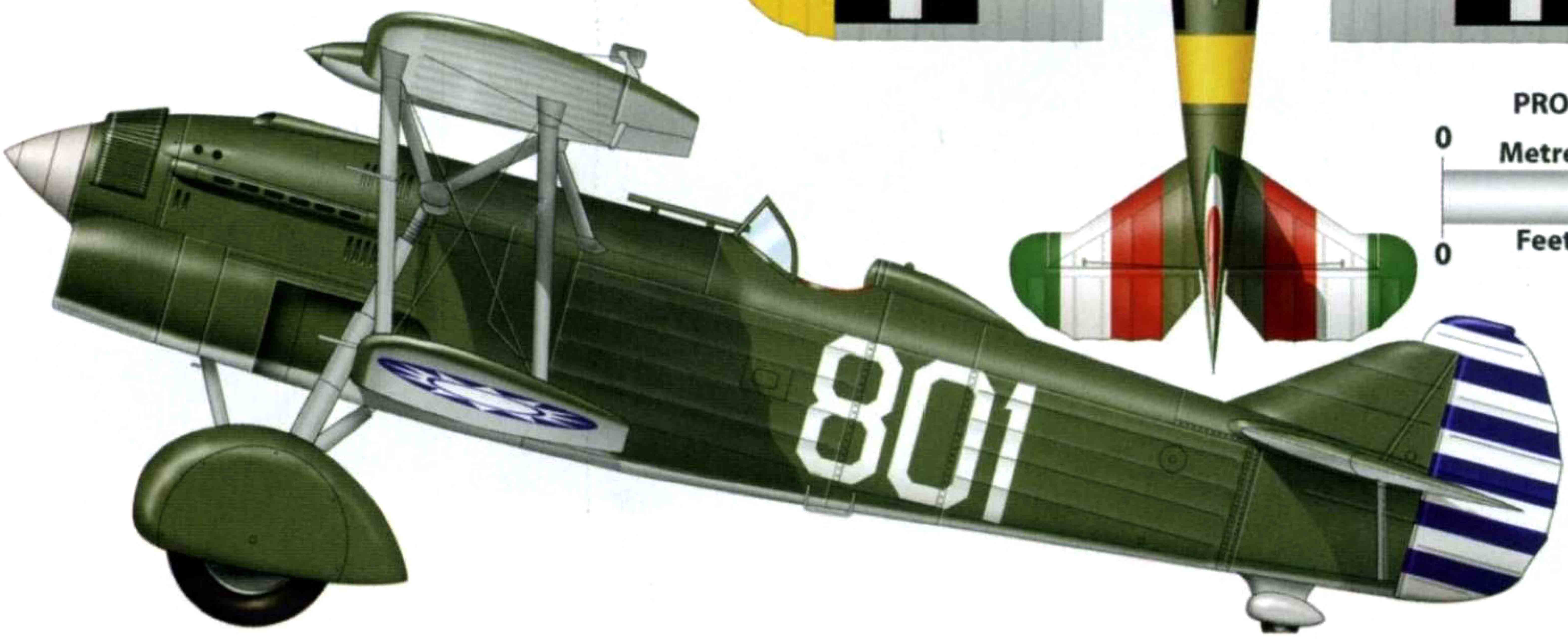
Fiat CR.32 *Quater* CN, 356ª Squadriglia Autonoma, Napoli-Capodichino, summer 1940. Verde Mimetico 3 uppersurfaces with Grigio Azzurro Chiaro undersides; code in black. Upper wing markings in black only, those below lower wings in black on a white background

Below: Fiat CR.32 *Quater*, MM.4227, 163ª Sq. Autonoma, Gadurrà, spring 1941. Giallo Mimetico 3/Verde Mimetico 3/Marrone Mimetico upper surfaces with Grigio Azzurro Chiaro undersides; codes in black/red. Serial in white with black drop shadow; red front to spinner and upper wing bullet fairing. Wing markings in black on white background



Above and Right: Fiat CR.32*bis*, V-196, Pilot Training School, Hungarian Air Force, Veszprem, 1942. The aircraft appears to have been resprayed evenly in dark green over a previously mottled camouflage finish which lightly shows through; undersurfaces in Italian Grigio Azzurro Chiaro. Green/white/red horizontal and vertical tail stripes; white crosses on a black square in six positions. Yellow bands around fuselage and lower wingtips. Puma marking of previous unit 2/2 squadron retained on fuselage sides

PROFILES 1:48 Scale
0 Metres 1 2
0 Feet 3 6



Fiat CR.32, '801', Nationalist Chinese Air Force. Dark green upper surfaces; light blue/grey undersides; silver spinner. National markings in standard four wing positions; rudder is striped in blue and white

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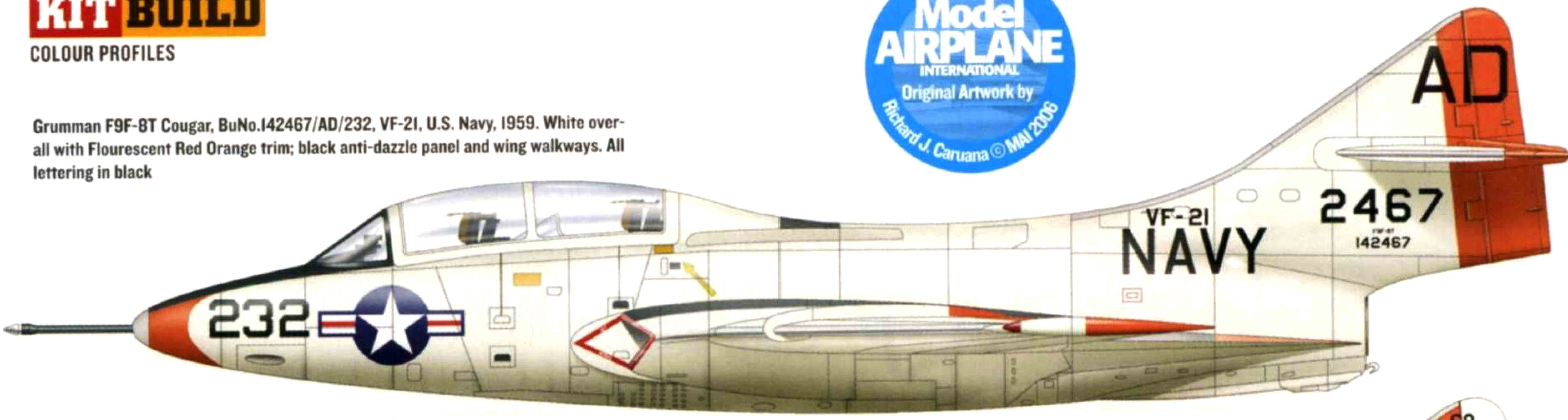
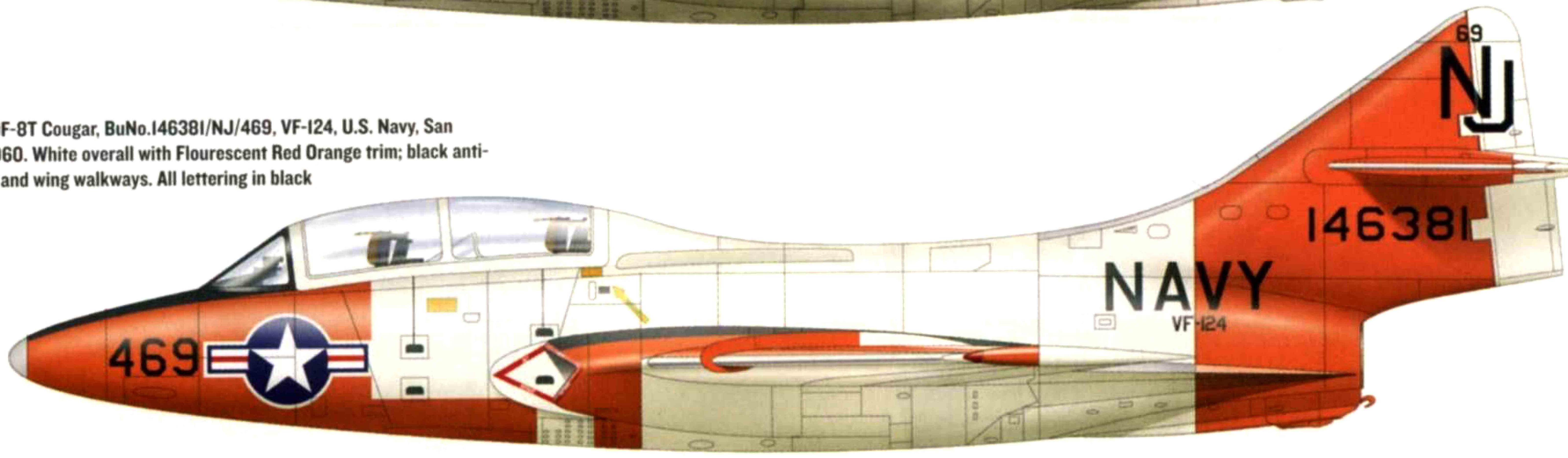
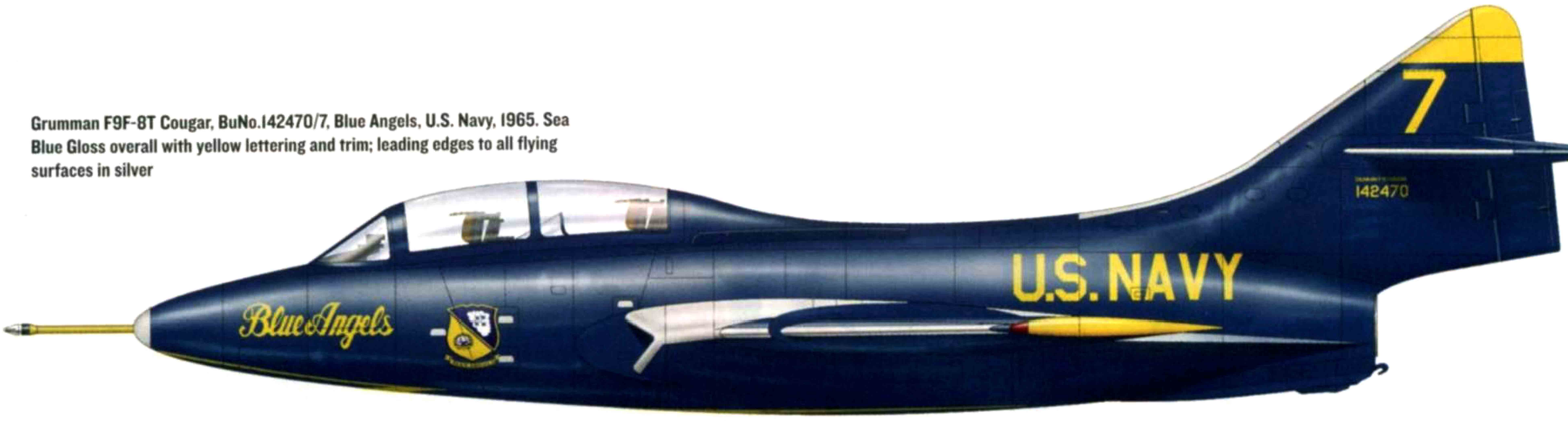
Grumman F9F-8T Cougar, BuNo.142467/AD/232, VF-21, U.S. Navy, 1959. White overall with Flourescent Red Orange trim; black anti-dazzle panel and wing walkways. All lettering in black



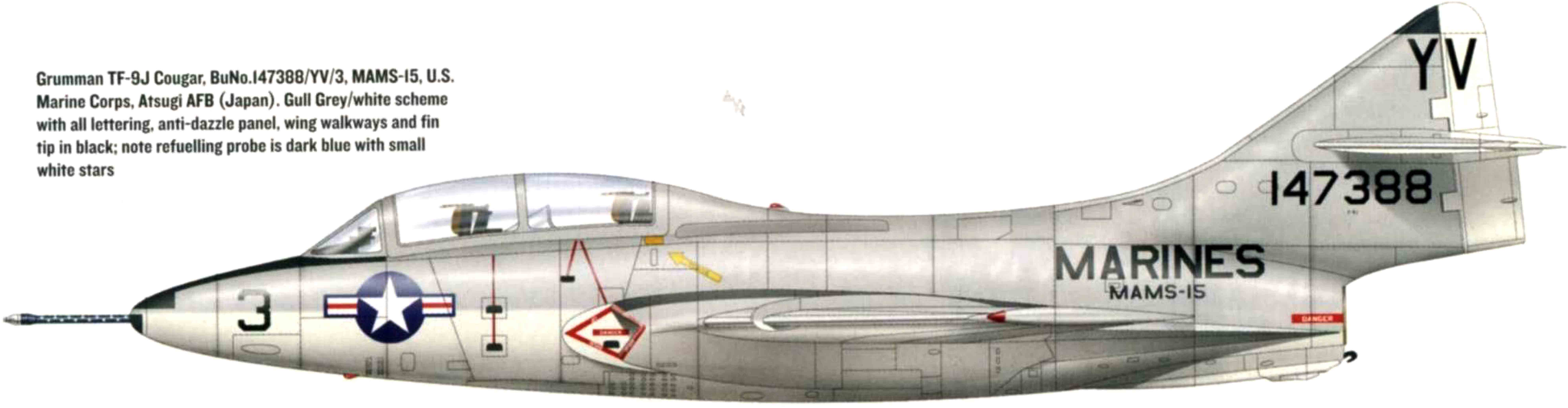
Grumman F9F-8T Cougar, BuNo.146381/NJ/469, VF-124, U.S. Navy, San Francisco, 1960. White overall with Flourescent Red Orange trim; black anti-dazzle panel and wing walkways. All lettering in black



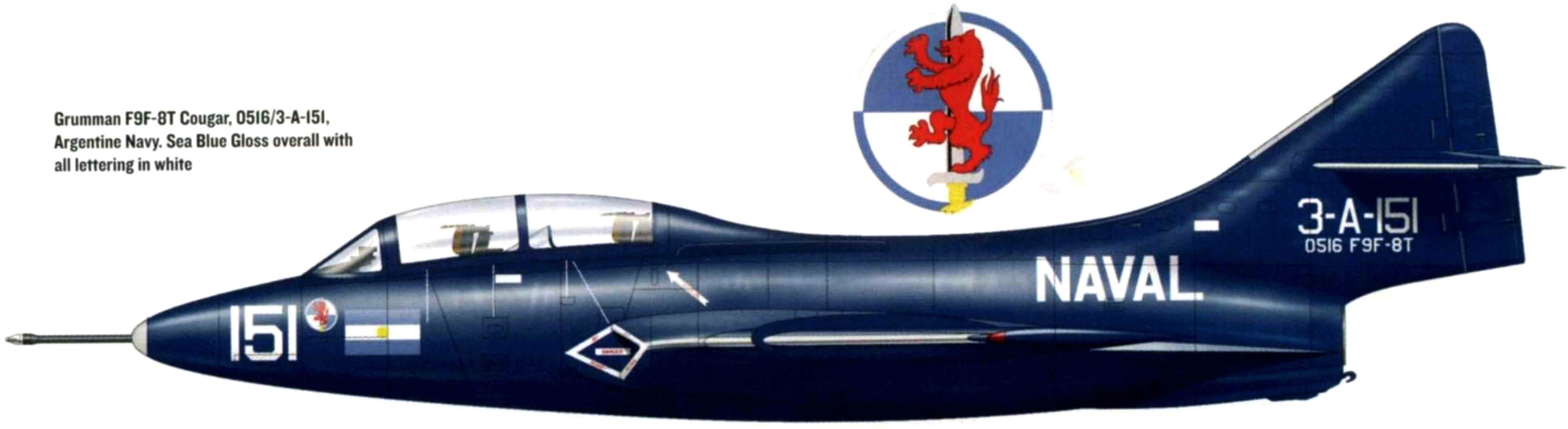
Grumman F9F-8T Cougar, BuNo.142470/7, Blue Angels, U.S. Navy, 1965. Sea Blue Gloss overall with yellow lettering and trim; leading edges to all flying surfaces in silver



Grumman TF-9J Cougar, BuNo.147388/YV/3, MAMS-15, U.S. Marine Corps, Atsugi AFB (Japan). Gull Grey/white scheme with all lettering, anti-dazzle panel, wing walkways and fin tip in black; note refuelling probe is dark blue with small white stars



Grumman F9F-8T Cougar, 0516/3-A-151, Argentine Navy. Sea Blue Gloss overall with all lettering in white



Wellington Mk Ia, N2944, OJ•C, No.149 Squadron, RAF Mildenhall, December 1939. Dark Earth and Dark Green uppersurfaces with Night undersides. Type A roundels on fuselage sides and above wings; codes in Sky Grey, serial in black. Note underwing roundels have either not yet been applied or had been painted over

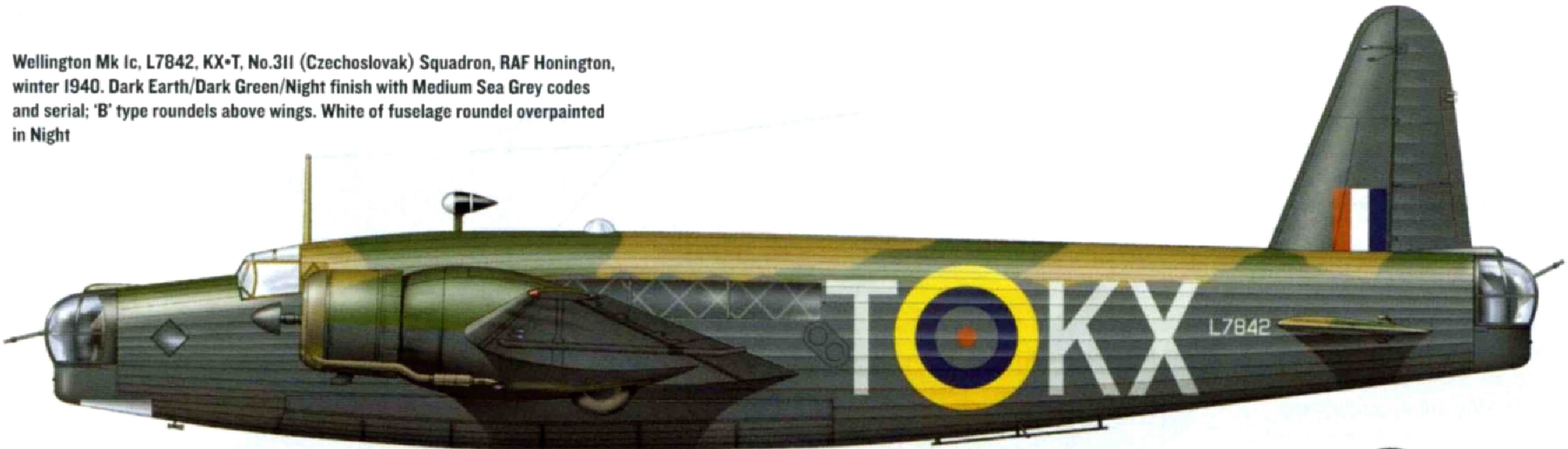
Wellington Mk Ia, N2912, LG•G, No.215 Squadron, RAF Honnington, April 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and Night serials; 'B' type roundels above wings. Note different styles of code 'G'

Wellington Mk Ic, P2927, KO•F, No.115 Squadron, RAF Kinloss, May 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes; serial in Night. 'B' type roundels above wings

Wellington Mk Ic, R3206, OJ•M, No.149 (East India) Squadron, RAF Mildenhall, June 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serials; 'B' type roundels above wings. White section on fuselage roundel painted over in Night; note unusual style of fin flash

Wellington Mk Ic, N2778, BU•R, No.214 (Federated Malay States) Squadron, RAF Stradishall, November 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serials; 'B' type roundels above wings

Wellington Mk Ic, L7842, KX•T, No.311 (Czechoslovak) Squadron, RAF Honington, winter 1940. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serial; 'B' type roundels above wings. White of fuselage roundel overpainted in Night



Wellington Mk Ic, R1042, JN•A, No.150 Squadron, RAF Newton, winter 1940-41. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serial; Night undersides. 'B' type roundels above wings; note camouflage patch beneath serial on fuselage, both sides

Wellington Mk Ic, N2756, HD•U, No.38 Squadron, Fayid (Egypt), early 1941. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serials; 'B' type roundels above wings

Wellington Mk Ic, T2817, •K, No.148 Squadron, RAF Luqa (Malta), February 1941. Dark Earth/Dark Green/Night finish with codes and serial in Medium Sea Grey; 'B' type roundels above wings

Wellington Mk Ic, N2768, LN•H, No.99 Squadron, RAF Waterbeach, March 1941. Dark Earth/Dark Green/Night finish with Medium Sea Grey codes and serials; 'B' type roundels above wings

WRITTEN BY RICHARD J. CARUANA

A quartet of Sabres F Mk 4s from No.130 Squadron flying from RAF (Germany) Brüggen in September 1954. These aircraft has still not been painted with the colourful red/blue/white flashes flanking the fuselage roundels (R.J. Caruana Archives)

SABRES FOR THE RAF

Bought as a stop-gap measure, the North American F-86 was the RAF's first operational swept-wing fighter

The aerodynamic development scene of the immediate post-war era was characterised by sharp contrasts on either side of the Atlantic. Whereas the tempo of wartime research was to continue unabated in America, the British industry was led by Government into an austerity programme, under the conviction that the Gloster Meteor would serve well into the early fifties. In the United States, a very innovative aircraft was taking shape, one that would leave an indelible mark on fighter development, the North American F-86 Sabre.

Barely five years after the end of a world war that had bled its major participants dry (literally and financially) another conflict broke out in the Far East. At that time, Hawker Aircraft Ltd were absorbed by development work on the P.1040, which stemmed from the company's first jet design, the P.1035 (later to be called Sea Hawk - see Issue 14, September 2006). Intrigued by the challenge of designing a competitor to the F-86 Sabre, Hawker handed the Sea Hawk production programme to Armstrong-Whitworth in order to concentrate on Air Ministry Specification F.43/46, calling for a single-seat fighter powered by an axial flow jet engine.

Supermarine had also been working on a new jet fighter, this time to Specification E.41/46, as a swept-wing version of the Attacker. Known as the Type 510 it eventually evolved into the Type 535, prototype to the Swift. Handling was found to be smooth and pleasant and Supermarine appeared to be making progress, albeit at its own cost having invested a lot of its own resources into the project. So much so, that it even organised a tour for its design team to Germany where the first Royal Canadian Air Force (RCAF) Sabres had been stationed, to take a closer look at this marvel from across the Atlantic. They found, much to their amazement, that the Sabre was like something out of the future, highly finished both inside and out. The cockpit alone was described as coming from "the 21st century" whilst that of Supermarine's fighter-to-be was practically indistinguishable from that of a Spitfire!

As could be expected, neither Supermarine's nor Hawker's new jet aircraft was anywhere near looking like a fighter, let alone nearing production and service. The 'best' British fighter in Korea was to be the Meteor as flown by the Royal Australian Air Force (RAAF). So it must have been with some chanting of 'mea culpa' that the Air Ministry was forced to order, not without some embarrassment, 430 Sabres under the United States Mutual Defense Air Program (MDAP) in order to fill the gap until indigenous types would become available. Some incentive was found in procuring these fighters from Canada, where the F-86 was being built under licence.

SABRES ON ORDER

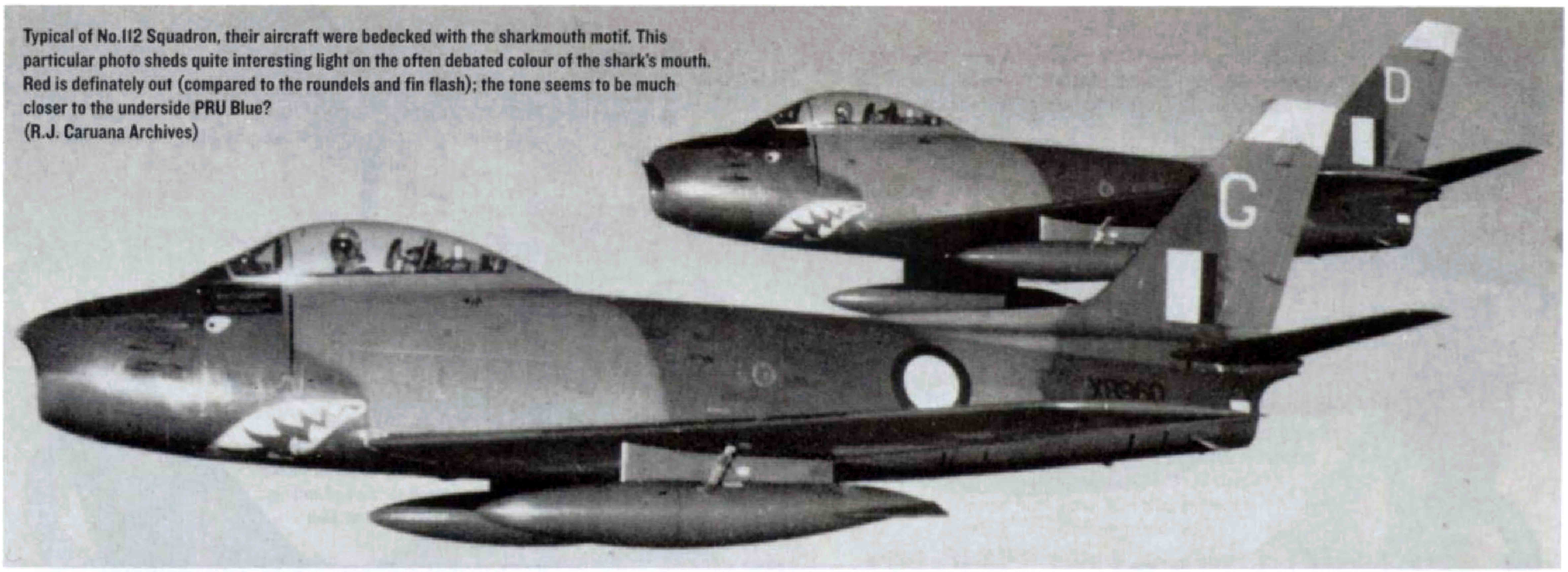
Originally, an order for 370 had been placed to replace de Havilland Vampires that were serving in Europe within the 2nd Tactical Air Force (TAF). These were to be followed by a further 60 aircraft for use by Fighter Command in Britain. The first batch consisted of three Canadair F Mk 2s (XB530-532); being the first of their type for the RAF they were logically redesignated F Mk 1s in British service but this was changed to F Mk 2s in order to avoid confusion. The balance was to be made up of Canadair Sabre F Mk 4s, which once again were originally to be known as F Mk 2s, but to avoid even further confusion the original F Mk 4 designation was retained. These consisted of XB533-551 (the last in this batch replaced XB530 which was returned to Canada), XB575-603, XB608-646, XB664-713, XB726-769, XB790-839, XB856-905, XB941-990 and XD102-138; XB973-977, XD139-144 and XD167-210 were serials allotted to RAF Sabres but immediately cancelled. The 60 aircraft ordered for use in Britain were the following: XD707-736 and XD753-781 (in actual fact only 59 were delivered).

The Air Ministry apparently had decided to tie itself up in knots on the Sabre; not a little confusion arose when it was decided that Sabres serving in Europe should carry 'XB' serials while those in UK would be allocated serials in the 'XD' range. In order to do this, a renumbering exercise was conducted as follows: XD102-105 became XB647-650, XD106-111 became XB770-775, XD112-116 became XB851-855, and XD117-138 became XB978-999. This worked for most, using up unallocated serials, except for the last block of 12 aircraft that were now given duplicated serials allocated to other Sabres! To solve this matter XB901-905 and XB941-990 were renumbered XB912-916 and XB917-977 respectively. Sabres acquired through MDAP funds had also been allocated United States Air Force (USAF) serials 52-10177 to 10236, though these were never applied.

Apart from the first three F Mk 2s delivered, which were built by Canadair to F-86E-5-NA standards, all operational Sabres within the RAF were F Mk 4s. Originally it had been planned that this version should be powered by the Orenda 3, but as aircraft were already leaving the production line before this engine became available it was decided to install the General Electric J47-GE-13 turbojet. Canadair's F Mk 4 was practically identical to the F-86-10-NA which, though originally planned to be powered by a J47-GE-27, eventually had the same engine as its Canadian counterpart. The F Mk 4 also embodied a host of refinements, such as an improved compass system, cockpit pressurisation and air conditioning systems, and the new Type A-4 gun-bomb aiming system. The first F Mk 4 performed its maiden flight on 28th August 1952.

No.1 Long Range Ferry Unit of RAF's Transport Command flew the first Sabres across the Atlantic on 9th December 1952, arriving in the UK on 2nd January of the following year. This was the first of a series of such long-range flights delivering all RAF Sabres to Britain via Quebec, Goose Bay, Bluie West-One, Keflovik, Prestwick and finally on to No. 5 Maintenance Unit at Kemble. At one time as many as 64 aircraft were ferried in one flight.

All Sabres were delivered in a natural metal finish, with RAF roundels in place, together with the RAF serial in the standard position and the last three



Typical of No.112 Squadron, their aircraft were bedecked with the sharkmouth motif. This particular photo sheds quite interesting light on the often debated colour of the shark's mouth. Red is definately out (compared to the roundels and fin flash); the tone seems to be much closer to the underside PRU Blue? (R.J. Caruana Archives)

Sabre F Mk 4, XD727/D, belonging to No.92 Squadron. Together with No.66 Squadron this unit formed the Linton-on-Ouse Sabre wing, the only Fighter Command wing based in Britain(R.J. Caruana Archives)

Canadair Sabres for the RAF awaiting delivery to Britain. These were all supplied in a natural metal finish, camouflage then being applied at Kemble or Lyneham (R.J. Caruana Archives)

digits of the Canadian serial on the nose. Camouflage was applied either at Kemble or Lyneham. A disruptive pattern was applied to the upper surfaces in Dark Sea Grey and Dark Green; aircraft destined for Germany (XB serials) had PRU Blue undersides added while those for home use (XD serials) were painted Aluminium underneath. Another distinguishing feature between the two schemes was the demarcation line between upper and lower surface colours – high up on the fuselage for the former and much lower down for the latter. The only exceptions appear to involve a small batch of aircraft flown by the Sabre Conversion Unit at Wildenrath that retained their natural metal finish, due to their immediate introduction into service.

Sabre XB982 became test bed for the Bristol Siddeley Orpheus 801 engine, flying for the first time on 3rd July 1958. Providing some 6,800lb of thrust, it proved to perform decidedly better than the RAF F Mk 4 Sabres; however, by that time the type had been nearly completely withdrawn from service and the Orpheus-engined Sabre was never adopted. This unique aircraft was eventually scrapped in 1960.

SABRE SERVICE

The sterling work of No.1 Long Range Ferry Unit was quickly acknowledged, and on 1st February 1953 it was reorganised as No. 147 Squadron. In April it moved from Abingdon to Benson from where it continued its job of ferrying Sabres to the various units then converting to the type in Germany. Eventually it was even engaged in transferring Venoms to the Middle and Far East, and when the time came for the RAF to give up the Sabres it was still there to exchange them with Swifts and Hunters.

The first front-line RAF unit to be equipped with the Sabre was No.67 Squadron at Wildenrath, where they replaced the unit's Vampires FB Mk 5s in May 1953. Next in line was No.3 Squadron, sharing the same base as No.67. Re-equipment of the new swept-wing fighter continued to the following RAF Germany units within NATO's No.2 TAF: Nos.4, 20, 26, 71, 93, 112, 130 and 234. The two units based in Britain with Fighter Command were Nos.66 and 92 Squadrons, both converting from Meteor F Mk 8s at Linton-on-Ouse in December 1953 and January 1954 respectively. Sabres were also to be found with No.229 Operational Conversion Unit (OCU) at Chivenor, the Air Fighting Development Unit (AFDU) at West Raynham and the Central Gunnery School (CGS) at Leconfield. The Aircraft and Armament Experimental Establishment (A&AEE) at Boscombe Down in Wiltshire also flew a number of Sabres.

Very few of the F Mk 4s were delivered with the extended 'hard' or '6-3' wing, which featured an extended fixed leading edge introduced to the F-86E through experience gained in Korea. A good number of RAF Sabres, however, later had these wings exchanged for the original 'slatted' type. These modified wings can be identified by the addition of a wing fence and the extension of the wing chord onto the ammunition bay door on the forward fuselage.

The Canadair Sabre F Mk 4 brought with it another major change for most units operating in Germany. Vampire-equipped squadrons were mainly dedicated to ground-attack; this role had to change to air superiority and interception. Although the Sabre marked a definitive improvement on any other RAF fighter then in service with the RAF, it did have a number of limitations. Initial rate of climb was about 5,000ft per minute, but it took nearly 12 minutes to reach 35,000ft. Acceleration was rather limited as the J47-GE-13 delivered only 5,200lb thrust. Its major adversary, the MiG-15, could boast better overall performance, and could only be equalled if the Sabre had attained enough altitude that could be converted into energy in a shallow dive. Another significant drawback was its armament of six 0.5in Browning machine guns, a significant decline in firepower from the quartet of 20mm cannon previously used on Meteors, Venoms and Vampires (and, indeed, on most RAF fighters from World War II). Apart from that, it handled beautifully and immediately gained the approval of most pilots who flew it.

Problems with engine power could have been solved had the RAF opted to continue flying the Sabre. Only a couple of years after the introduction of the type into RAF service, the RCAF in Europe had already moved on to the Mk 5 and 6, equipped with the higher thrust of the Orenda engines. By June 1955, the first Hunters F Mk 4 had arrived at Oldenburg, Germany, to equip No.26 Squadron, followed soon afterwards by No.4 Squadron at Jever. At that time the Hunter was still suffering some teething troubles and many pilots considered it to be inferior to the Sabre, notwithstanding its four-cannon armament. Thankfully, for the Hunter, its troubles were soon ironed out and Sabres began to be supplanted with the new Hawker interceptor. 'Retired' Sabres from Germany were sent back to England and collected at Nos.5 and 33 Maintenance Units (MU) from where they were distributed to various aircraft companies. After a careful survey, those found to be not up to standard were 'reduced to produce', while the rest were given a new lease of life with the fitting of the 'hard' wing. All RAF markings were painted over, although the typical RAF camouflage scheme was retained, and USAF 'stars and bar' markings were painted on. The original Canadian serials were used for identification, painted on the fins, with the last three digits repeated aft of the USAF standard 'FU-' codes on the fuselage. In total, 303 ex-RAF Sabres were returned to the United States, the rest being delivered to Italy and Yugoslavia.

These were usually referred to as F-86E(M) – 'M' standing for modified. One such example, ex-XB812 (that had been handed over to the Italian Air Force), returned to the UK where it was refurbished, repainted in the colours it wore during its service with No.93 Squadron and placed on display at the RAF Museum, Hendon.

Canadair Sabre F Mk 4, XB673/G, Sabre Conversion Flight, RAF Wildenrath, Germany. Natural metal overall with black serials and anti-dazzle panel. Red code 'G' on fin; note badge on nose

Canadair Sabre F Mk 4, XB984/K, No.3 Squadron, Geilenkirchen (Germany), 1954. Glossy Dark Sea Grey/Dark Green/PRU Blue finish with green trim to nose and vertical tail surfaces, outlined in yellow;black serials and anti-dazzle panel, code 'K' in red, outlined in yellow. Unit crest on white disk below windscreen

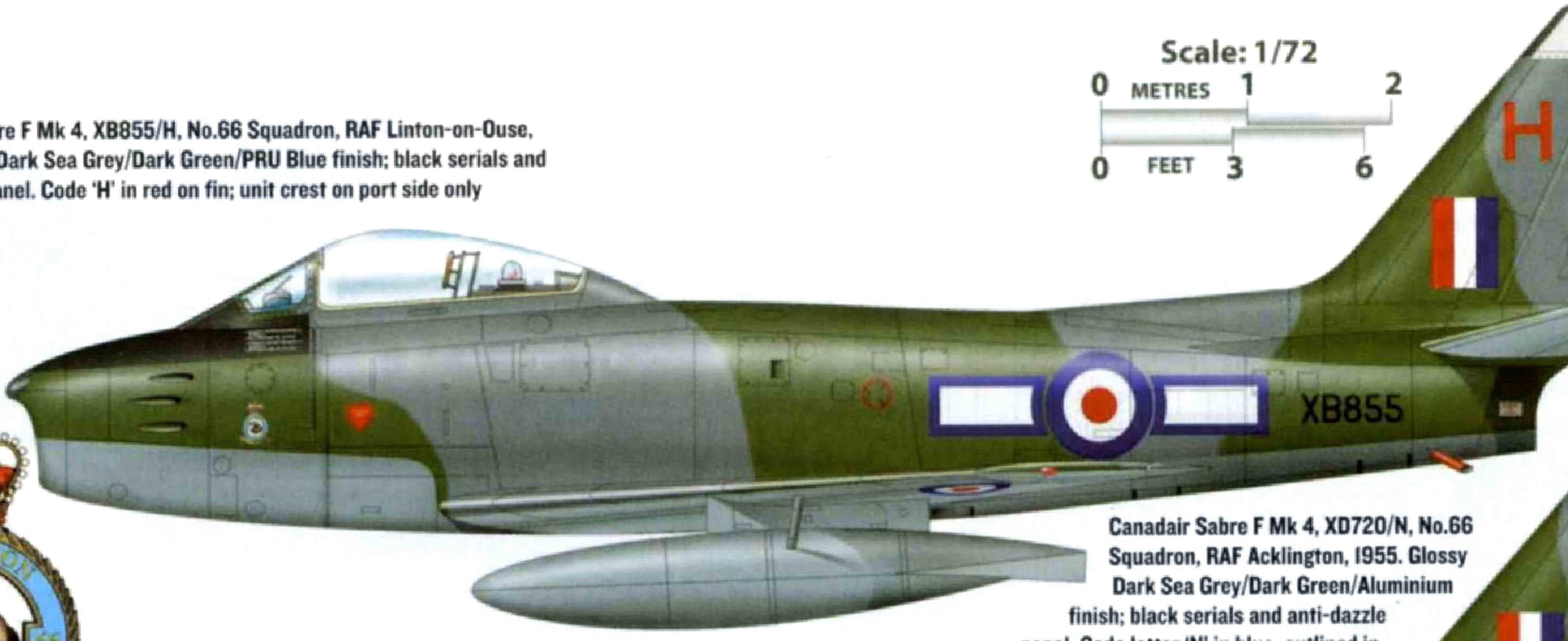
Canadair Sabre F Mk 4, XB775/M•B, No.4 Squadron, RAF Jever (Germany), 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Codes on fuselage side in light blue, with 'M' repeated on front nosewheel door. Unit badge on fin

Canadair Sabre F Mk 4, XB981/Q, No.4 Squadron, RAF Jever (Germany), 1956. Glossy Dark Sea Grey/Dark Green/PRU Blue finish. black serials and anti-dazzle panel; light blue code 'Q' on fuselage repeated on noswheel door. Badge on fin

Above: Canadair Sabre F Mk 4, XB900/A, No.20 Squadron, RAF Oldenberg (Germany), 1954. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Red/white/green stripes over blue flashes flanking fuselage roundels. 'A' on fin in white; unit badge in a white shield on the nose

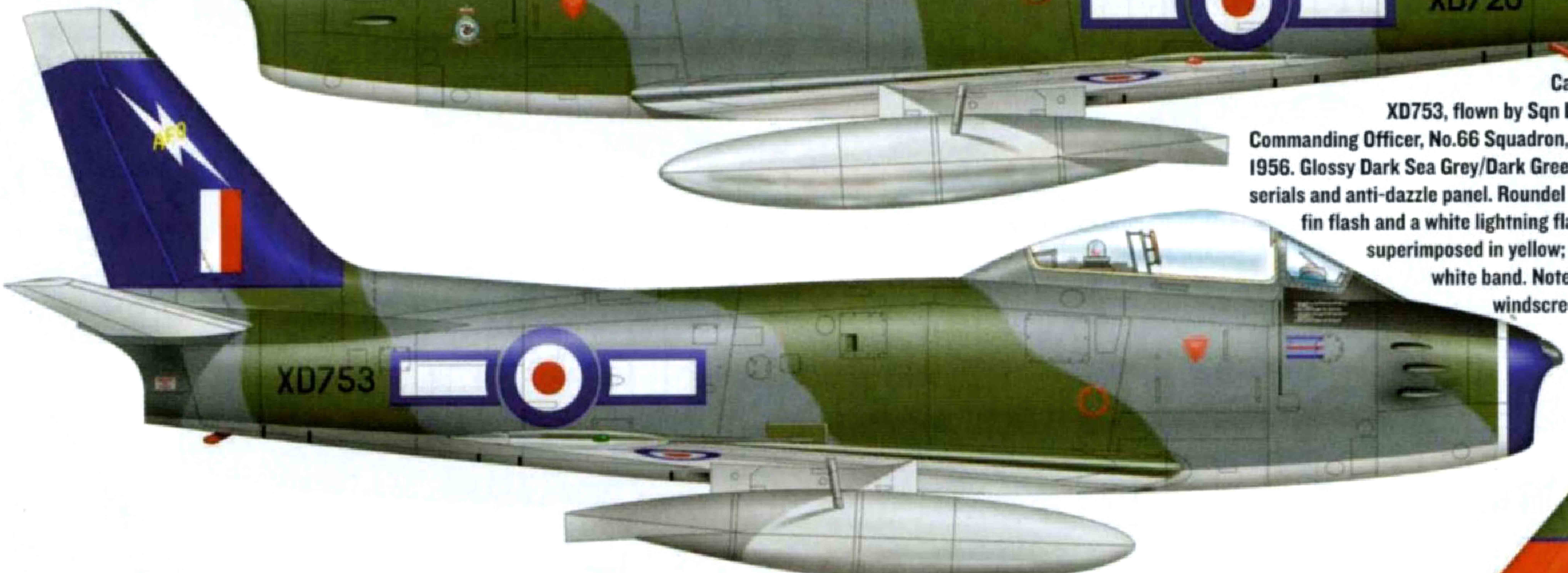
Canadair Sabre F Mk 4, XB577/V, No.26 Squadron, RAF Oldenburg (Germany), 1954. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Yellow code 'V'; unit badge on fin (note that the latter is not 'handed' on starboard side)

Canadair Sabre F Mk 4, XB855/H, No.66 Squadron, RAF Linton-on-Ouse, 1954. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Code 'H' in red on fin; unit crest on port side only



Canadair Sabre F Mk 4, XD720/N, No.66 Squadron, RAF Acklington, 1955. Glossy Dark Sea Grey/Dark Green/Aluminium finish; black serials and anti-dazzle panel. Code letter 'N' in blue, outlined in white; unit crest on port side only

Canadair Sabre F Mk 4, XD753, flown by Sqn Ldr A.F. Osborne (DFC), Commanding Officer, No.66 Squadron, RAF Linton-on-Ouse, 1956. Glossy Dark Sea Grey/Dark Green/Silver scheme; black serials and anti-dazzle panel. Roundel Blue fin with standard fin flash and a white lightning flash with initials (AFO) superimposed in yellow; Roundel Blue nose with white band. Note rank pennant under windscreen



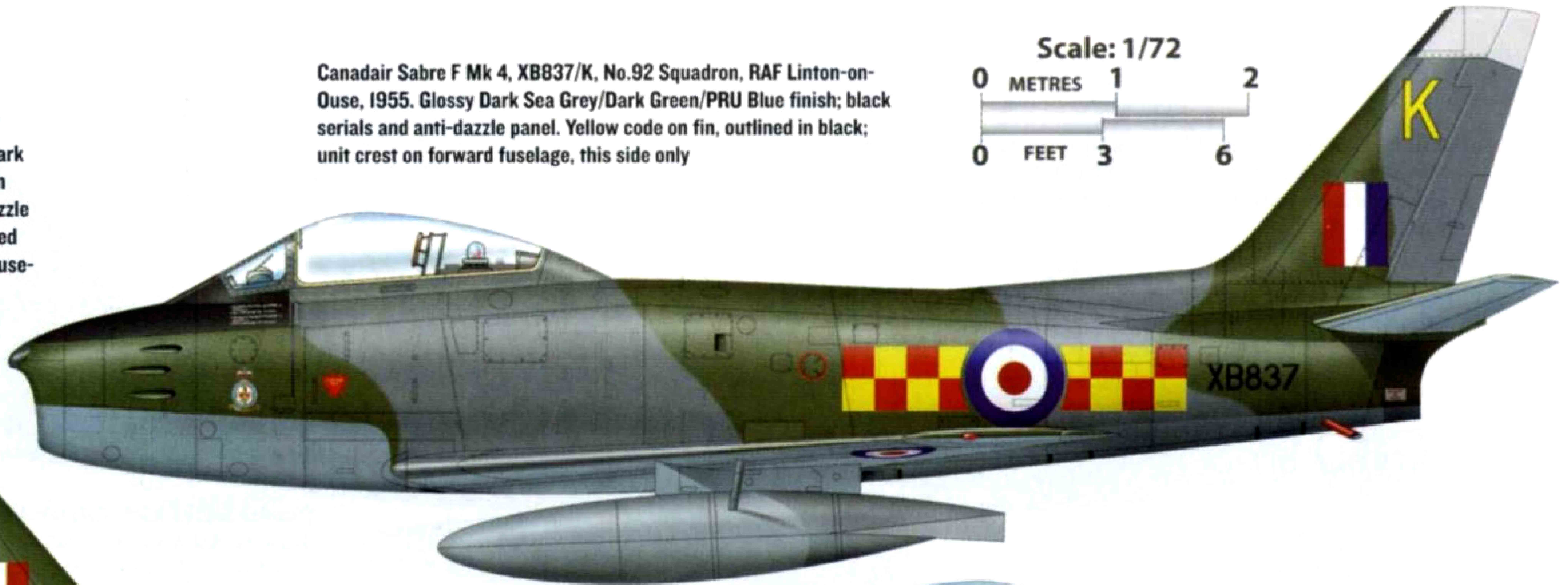
Above: Canadair Sabre F Mk 4, XB686, flown by Gp Capt J.E. Johnson, Station Commander, RAF (Germany) Wildenrath, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Red lower canopy frame and end fairing; red lower section of vertical tail surfaces, with a narrow blue border on top. 'JEJ' in white on canopy frame, aft of rank pennant; initials, also in white, on red front nosewheel door

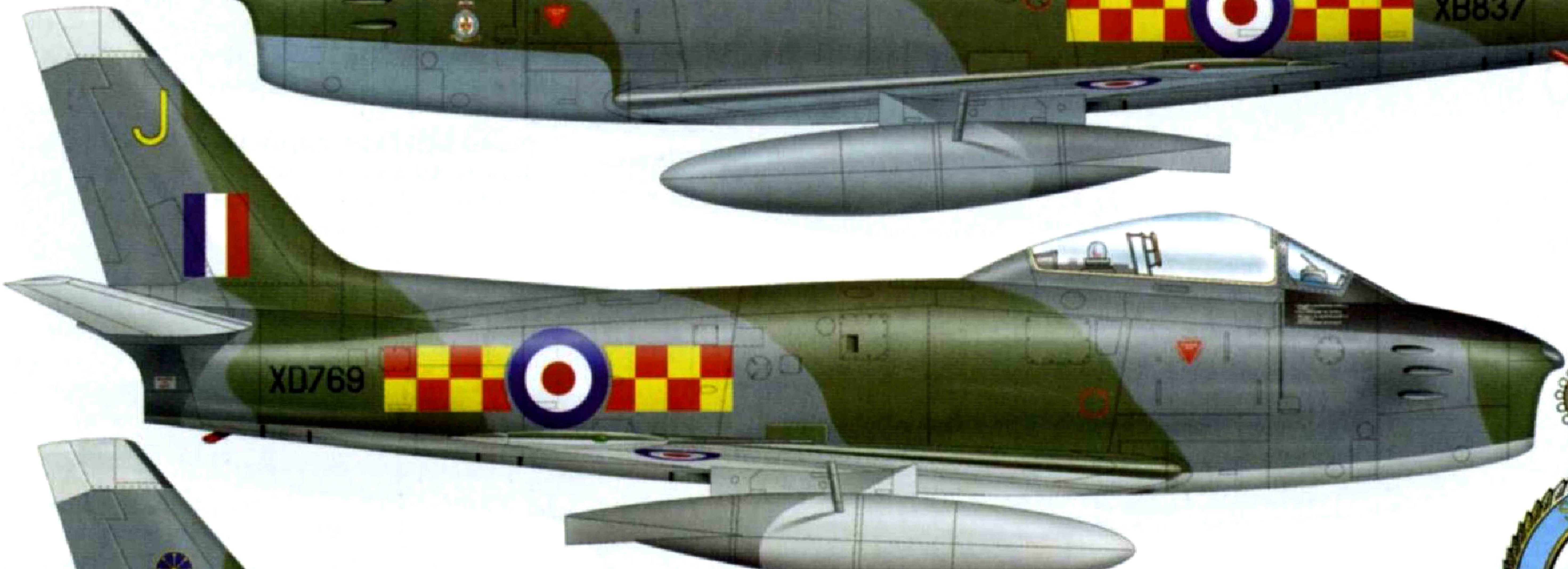
Above: Canadair Sabre F Mk 4, XB796/Z, 'B' Flight, No.67 Squadron, RAF Wildenrath, Germany, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Code 'Z' on fin in white, outlined in black; blue band around top of fin/rudder, outlined in yellow ('A' Flight aircraft had red band)

Canadair Sabre F Mk 4, XB630/P, No.71 Squadron, RAF Wildenrath, Germany, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Yellow/white flashes with black diamonds flanking fuselage roundels; 'P' in yellow outlined in black on fin. Squadron emblem on a white disc aft of gun ports

Below: Canadair Sabre F Mk 4, XD769/J, No.92 Squadron, RAF Linton-on-Ouse, 1955. Glossy Dark Sea Grey/Dark Green/Aluminium finish; black serials and anti-dazzle panel. Yellow code on fin, outlined in black; unit crest on forward fuselage other side only

Canadair Sabre F Mk 4, XB837/K, No.92 Squadron, RAF Linton-on-Ouse, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Yellow code on fin, outlined in black; unit crest on forward fuselage, this side only





Canadair Sabre F Mk 4, XB829/D, No.93 Squadron, RAF Jever, Germany, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Code in yellow; unit marking on both sides of fin

Above Right: Canadair F Mk 4, XB978/N, No.112 Squadron, RAF Brüggen, Germany, September 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. White 'shark' teeth with medium blue (or PRU Blue) mouth, outlined in red; white code 'N' on fin

Below: Canadair Sabre F Mk 4, XB929/Q, No.130 Squadron, RAF Brüggen, Germany, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. White code 'Q' within a black disk on fin

Canadair Sabre F Mk 4, XB885/D, No.234 Squadron, RAF Oldenburg, 1954. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Red/black checks on nose; code 'D' in red, outlined in yellow. Unit badge on fin on a white disk

Model AIRPLANE INTERNATIONAL
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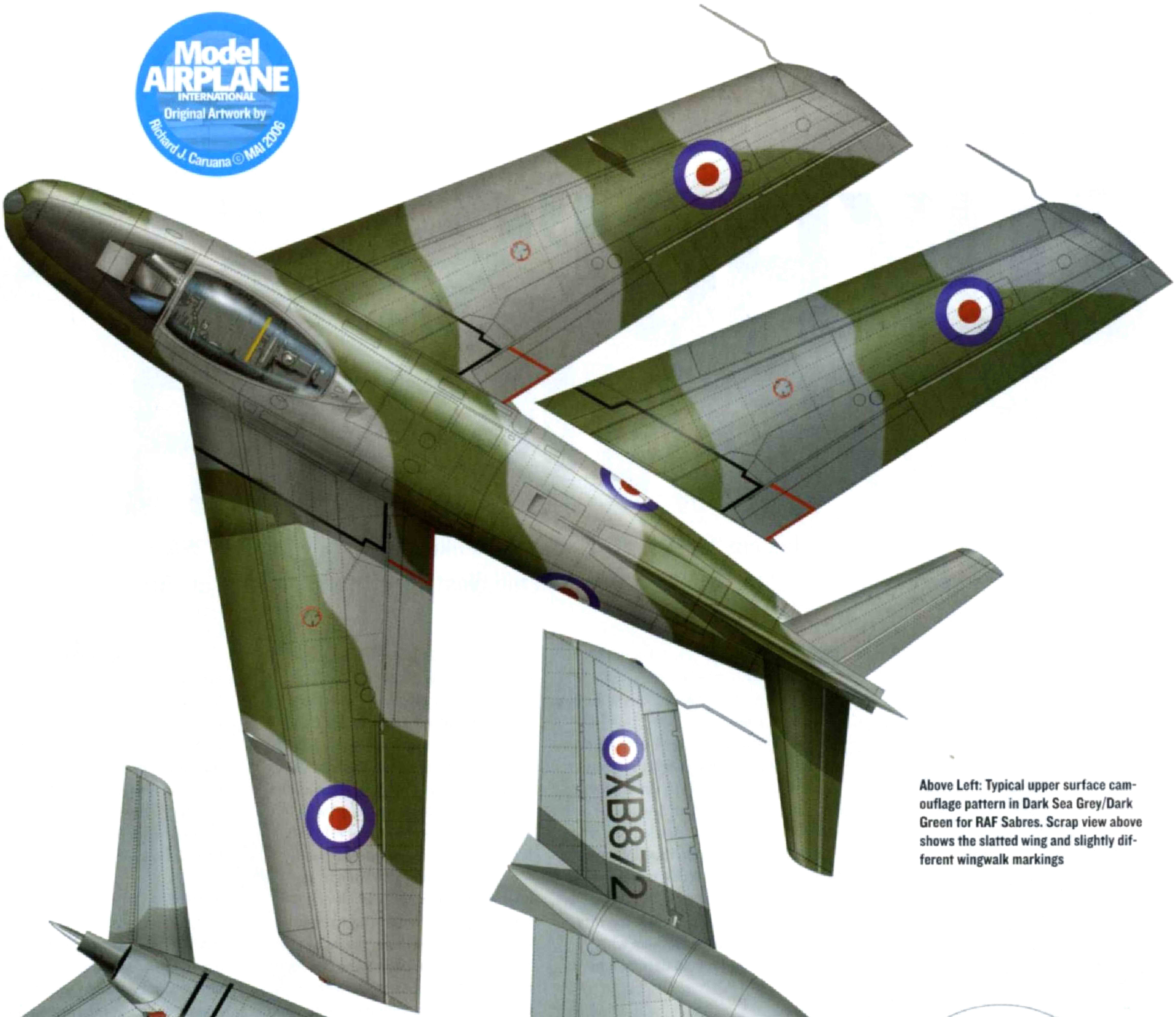
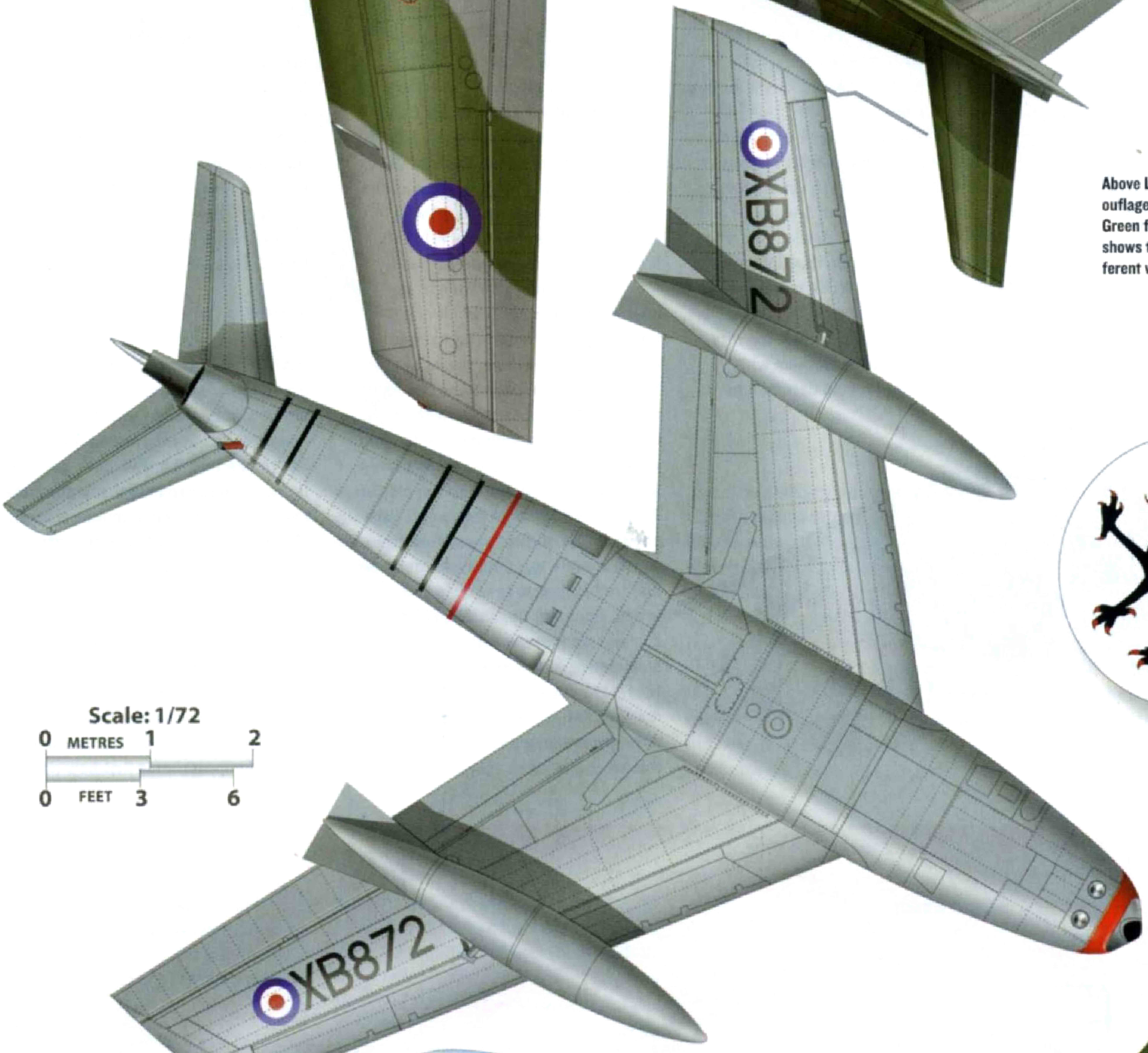


Above Left: Typical upper surface camouflage pattern in Dark Sea Grey/Dark Green for RAF Sabres. Scrap view above shows the slatted wing and slightly different wingwalk markings



Scale: 1/72
0 METRES 1 2
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Canadair Sabre F Mk 4, XB872/R, 'C' Flight, No.234 Squadron, RAF Geilenkirchen, Germany, 1955. Glossy Dark Sea Grey/Dark Green/PRU Blue finish; black serials and anti-dazzle panel. Red nose chevron, outlined in white; white code 'R' on fin. Unit marking on forward fuselage